

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York Office, 30 Church Street

EDWARD A. SIMMONS, President
LUCIUS B. SHERMAN, Vice-Pres.

HENRY LEE, Vice-Pres.

SAMUEL O. DUNN, Vice-Pres.

CECIL R. MILLS, Vice-Pres.

FREDERICK H. THOMPSON, Vice-Pres.

ROY V. WRIGHT, Sec'y.

JOHN T. DEMOTT, Treas.

CHICAGO:
105 West Adams St.

WASHINGTON:
17th and H Streets, N. W.

CLEVELAND:
Terminal Tower

SAN FRANCISCO:
215 Market St.

Editorial Staff

SAMUEL O. DUNN, Editor
ROY V. WRIGHT, Managing Editor
ELMER T. HOWSON, Western Editor
H. F. LANE, Washington Editor

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. C. AUGUR
R. A. DOSTER
JOHN C. EMERY
MARION B. RICHARDSON
H. C. WILCOX
NEAL D. HOWARD
RICHARD W. BECKMAN
LLOYD GEORGE
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
GARDNER C. HUDSON
M. H. DICK
W. J. HARGEST

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, \$6.00. Foreign countries, not including daily editions \$8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, \$1.00; foreign countries, \$2.00. Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 89

August 23, 1930

No. 8

In this Issue

Livestock Rates By Railroad Less Than By Truck Page 351

An analytical comparison of rail and highway rates on livestock shipments, in which it is shown that Illinois shippers would have saved \$400,763 in 1927 if they had forwarded their animals by rail.

Modern Methods Used in Grading 354

Tells how the use of powerful and up-to-date equipment of large capacity is speeding up large construction projects on the Southern Pacific.

Santa Fe Operates First Air-Cooled Car to Pacific Coast 362

A description of this company's new dining car, with complete equipment for controlling temperature and humidity, which is now in regular transcontinental service on the "Chief."

EDITORIALS

"Labor Leaders and Railroad Employment"	347
Railroads to the Rescue	348
Increasing the Capacity of Double-Track Lines	349
Getting Best Results from Supply Work	349
How Some Railways Are Using Rail Motor Cars	350
Indexes to Volume 88	350

GENERAL ARTICLES

Livestock Rates By Railroad Less Than By Truck	351
Freight Car Loading	353
Modern Methods Used in Grading	354
Milwaukee Builds Medical Car	360
Freight Commodity Statistics	361
Santa Fe Operates First Air-Cooled Car to Pacific Coast	362
Pennsylvania Scores New Low Inventory Record	365
Railways and Shippers Oppose Howell Bill	367
Emergency Rates for Drought Relief	372
Revision of Cotton Rates Prescribed	373
Government Accident Report for 1929	375

COMMUNICATIONS AND BOOKS 376

LOOKING BACKWARD 377

ODDS AND ENDS OF RAILROADING 378

NEWS OF THE WEEK 379

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service



Every Oliver Track Bolt Is Carefully Heat-Treated

A large section of the great Oliver Plant is given over to the production of Track Bolts exclusively. Here the technique of bolt manufacture has reached its highest development.

The bolts are made of specially selected steel stock—heat-treated—then quenched and drawn in oil to produce that distinctive dense steel structure which makes Oliver the toughest and most enduring of all Track Bolts in railroad service.

For time-tested reliability always specify Oliver in your Track Bolt requisitions.

OLIVER IRON AND STEEL CORPORATION
PITTSBURGH

Branch Offices in the Principal Cities



Railway Age

Vol. 89, No. 8

August 23, 1930

Table of Contents Appears on
Page 5 of Advertising Section

“Labor Leaders and Railroad Employment”

ONE of the most important questions confronting the railways and their employees is as to the amount of traffic the railways will have a chance to handle in future. The answer will largely determine both earnings and the number of persons employed. An editorial entitled, “Labor Leaders and Railroad Employment,” which was published in the *Railway Age* of June 21, has drawn various replies from railway labor leaders. In that editorial it was pointed out that for some years the tendency of railway employment has been downward, and that this has been largely due to government policies which have helped to divert traffic to highways and waterways. A question was raised as to why leaders of railway labor organizations have said and done little in opposition to such policies.

Views of Labor Leaders

The replies made by labor leaders have been various and significant. The “Railroad Trainman,” the monthly magazine of the Brotherhood of Railroad Trainmen, in an editorial, has quoted large parts of our editorial, and made answers showing that the “Railroad Trainman” has published numerous articles opposing the government policies in question, that in many parts of the country railway employees have sought to cause freight to be shipped by rail rather than by highway, and that the national legislative representatives of the railway labor organizations arranged for the Congressional hearings at which employees of the Southern Pacific recently appeared against the Pittman long-and-short haul bill. The officers of the Brotherhood of Railroad Trainmen have said and done more in favor of fair and constructive regulation of railways than those of any other labor organization, and, excepting for their advocacy of full train crew and train limit laws, their activities usually have been helpful to the railroad industry. Perhaps nothing could be more significant of their desire to be helpful to the industry than the fact that they do not participate in the publication of the weekly paper “Labor.” The *Railway Age* admits that, in the main, the application to the past and present leaders of the Brotherhood of Railroad Trainmen of what was said in its editorial of June 21 would be unjust.

Some labor leaders have said in reply to our editorial that the railways themselves have had no definite policy regarding the subsidizing and regulation or lack of regulation of competing means of transportation. There is some truth in this; but that is no reason why the labor leaders themselves should not have adopted a policy regarding these matters. Attention has been called to the fact that many railways are operating motor trucks and coaches on highways, and that the *Railway Age* for some time has published a Motor Transport section in which it has encouraged them to do so. The answers to these statements seem obvious. First, there are many places where the railways can more advantageously use motor trucks and coaches than trains, as for rendering service in terminals and for short hauls. Second, other companies are using highways provided by the public to take traffic from the railways, and the railways have found that there is much of this kind of competition they cannot successfully meet, excepting by operating motor coaches and trucks themselves. Railway labor leaders and employees should oppose the government policies that create these conditions, rather than complain because the railways try to deal in the only way available with conditions which government policies already have created.

We have been told that the railways have not sought the co-operation of labor organizations in opposing unfair government policies. The railway labor leaders in the past have shown plenty of ability to take the initiative in movements of various kinds. They initiated in 1924 a movement which ran Senator LaFollette for President on a government-ownership platform. They have initiated numerous national movements for advances in wages and changes in the conditions of work of railway employees. When did it become necessary for them to receive requests for co-operation from the railways to enable them to start a movement for the advancement or protection of the interests of railway employees?

We have been asked if, in case an extensive system of inland waterways is developed, the railways will begin operating boats on them. They probably will, if the government will allow them to. If the government, by subsidizing water transportation, is going to divert traffic

from the railways, what difference is it going to make to railway employees whether the boats that deprive them of their jobs are operated by railway companies or other companies?

The labor leaders are intelligent and able men, and are familiar with the embarrassments which the railways encounter in trying to influence government policies. The railways are subject to strict government regulation, and, at the same time, have almost no friends in public life. Consequently, they can hardly oppose any government policy without antagonizing influential public men, who may make reprisals upon them. When the railways considered testing the constitutionality of certain provisions of the Dennison bill, which increased the capitalization of the government's barge line on the Mississippi river they were stopped by a threat of the passage of a bill abolishing the Pullman surcharge. Members of Congress do not make threats savoring of blackmail to intimidate labor leaders. The railways are treated by the government as they are because they have no political influence.

Labor Leaders and Government Policies

The railway labor leaders also have their embarrassments. One of them has remarked that they could not oppose certain government policies without antagonizing radical statesmen with whom they have had close working relations. But the labor leaders, unlike the railways, have great political influence and are not subject to government regulation. Has not the time come when they owe a higher duty to the members of their organizations than that of co-operating with radical public men who are seeking to ruin the railways, not only through their policies of valuation and rate regulation, but also through policies that divert traffic from the railways and deprive railway employees of their jobs?

The railways and their employees, because of the recent trend of traffic, are confronted with a situation such as never existed before. Regardless of the efforts of some labor leaders to evade the facts, the *Railway Age* has published statistics which prove conclusively that the decline in railroad employment within recent years has not been principally due to technological improvements in railroading, but to the enormous loss of passenger traffic that has occurred, and to the reduction of at least two-thirds that has occurred within the last decade in the rate of growth of freight traffic. Various policies of the government, such as those of charging inadequately for the use of the highways, developing inland waterways, refusing to let the railways make rates to meet steamship competition between the Atlantic and Pacific seabards, and failing to regulate other means of transportation as it does the railways, already have helped to divert large amounts of traffic from the railways and, if persisted in, will divert much more. These policies are not of economic benefit to the public, and every one of them is largely due to political influences. Regardless of whether their co-operation is sought by

railway executives or not, are railway labor leaders going to go on, as they have in the past, refraining from using their political influence to combat these policies?

The paper "Labor," which is published at Washington by most of the railway labor organizations, shows that in all parts of the country they are supporting candidates for Congress who have supported such government policies as we have mentioned, but it does not disclose that they are opposing any candidate because he has supported such policies. If "Labor" expresses the attitude of most railway labor leaders they are in favor of any candidate who will do all he can to injure the railroads, but are not opposed to any candidate because he favors government policies that help to deprive railway employees of their jobs. The political influence of railway labor leaders is well shown by the speed with which they succeeded in getting Congress at its last session to favor a provision regarding consolidations for the protection of the employment and incomes of railway employees. Why are they so much less alert and active regarding other policies that affect employees?

Political Influence of Railway Employees

The *Railway Age* now has reason to believe that before it published its editorial of June 21 many railway labor leaders had begun to give serious consideration to government policies tending to divert traffic from the railways. When they begin unitedly and openly to oppose such policies many public men will suddenly begin to see that treating the railways as they are now treated is not so helpful to their political interests, and therefore not so beneficial to the public, as they have been wont to believe. Most politicians feel that it is not only safe but useful to attack the railways because this makes a favorable impression upon the folks back home. The 1,700,000 railway employees and their friends are among the folks back home. They have great political influence. When is it going to begin to be used for their own protection?

Railroads to the Rescue

HOW quickly the government and people of the United States call upon the railways for extraordinary action in many kinds of emergencies! Other and competing means of transportation are being fostered with government aid; but it is notable that when a large part of the country recently was stricken by drouth it was not the highways or the waterways, but the railways, to which the government and people turned, and from which they got unusual service and a 50 per cent reduction of rates on livestock and feed to save the drouth-stricken territory from disaster.

Floods, drouths or storms—it is always the same. When the Mississippi valley was flooded a few years ago and navigation was practically suspended, the prop-

erty of the railways suffered heavy damage, but their officers and employees worked night and day to make repairs, detoured trains from one road to another, and people in the flooded areas were rescued, passengers and freight were moved, and in a surprisingly short time railway service was completely restored.

In the terrible weather of last winter the use of all kinds of motor vehicles was widely suspended, but, although trains were delayed, the railways continued to function and to handle their usual traffic, as well as that which usually moves by highway. Likewise this summer, when many of the principal inland waterways are too low for navigation, the railways are handling the freight of which the waterways were supposed to "relieve" them. When the government, over a year ago, called upon the railways to make an emergency reduction in rates on grain to reduce the surplus that had accumulated in this country, they promptly complied, although, as their officers anticipated, it did the American farmer no good and reduced railway earnings for the benefit of the foreign consumer.

Why are no other industries called upon to make a 50 per cent reduction in their prices to help the drouth sufferers? The railways are incurring as heavy losses of earnings owing to the business depression as any other industry. The demands made upon the railroads are, however, a tribute to them. They show that government officials and the public still recognize the fact that the railroads are an "essential" industry. Other means of transportation may, with government aid, divert traffic from them; but the public is still almost as dependent as ever on the railroads for service both under normal and abnormal conditions.

The troubles of the railroads are largely due to the fact that the reliability of their service is taken as a matter of course. The public, unfortunately, knows too little of the amount of capital, and the mental and physical exertion by officers and employees, that are required to enable the railways to furnish the service upon which the public so implicitly relies.

Increasing the Capacity of Double-Track Lines

THE problem of reducing train delays and increasing track capacity on double-track lines is being solved with increasing frequency by modern methods of directing train movements in either direction on one or more tracks. Operating officers have, for years, realized the possibilities of using idle main tracks to run trains against the normal direction of traffic, but the delays and danger introduced by the authorization of such moves by train order have limited the practice, and correctly so, because it is illogical to abandon temporarily the protection afforded by automatic block

signals, and resort instead to straight train-order operation.

Some roads, such as the Burlington, which has for years used either-direction operation on each track of double-track lines, have provided manual block protection for reverse movements with a check-locking system employing track circuits to insure that the entire block is clear before permitting a train to make a move against the normal direction of traffic. The Illinois Central has an intensively signaled 20-mile section of double track between Otto, Ill., and Gilman, with each track signaled in both directions and blocks so spaced as to permit following moves at one-mile intervals. There is no normal direction of traffic, for trains can be moved with equal facility on either track. With crossovers at either end and at three intermediate points, run-around movements are made constantly, entirely by signal indication. This installation, which was completed in 1924, was connected into existing interlockings at each end, and interlockings were provided at the three intermediate points. Recently a system of centralized control has been introduced for the purpose of concentrating at one station the control of the three interlockings and the signals for directing train movements.

This change-over is indicative of what is being done on other roads in the application of centralized traffic control for the direction of train movements in either direction on double-track lines, among which are the Texas & Pacific, the Boston & Maine, the Chicago, Burlington & Quincy, and the Missouri Pacific. The equipment required on such installations may vary from only the signaling to direct and protect the train movements, to a complete system including also the operation of all crossovers and junction switches.

Getting Best Results From Supply Work

DURING recent years the work of the Purchases and Stores Division of the American Railway Association seems to have included an increased amount of collaboration with other associations. The association has worked closely with the Railway Fire Protection Association for several years. It has also been represented at the annual meetings of the Railway Accounting Officers' Association, and, in its forest products' studies, has considered regularly the action taken by the Mechanical Division and the American Railway Engineering Association, as well as various recognized commercial groups, and is now engaged in joint studies with the Mechanical Division on the reclamation and repair of discarded materials.

Inter-relations of this kind are desirable and should be encouraged. The number of railway associations,

national and local, is large, and they are all engaged in considering practices and problems affecting the economy and efficiency of operation, but the natural inclination of each group is largely to make its investigations and do its work independently of the others. As a result, it frequently occurs that two or more associations attack the same problems and arrive at conclusions that differ in important respects. The reports of associations are likely to be ignored by all except their own members. They sometimes make recommendations as to what men engaged in other branches of railway work should do without making sure that those to whom these recommendations are addressed will ever learn about them.

Efficient supply work calls for closer co-operation between associations. It is difficult to find a branch of work in the maintenance of way, mechanical or operating departments of the railways which does not depend greatly upon an efficient and orderly system of supply, and it is equally true that the ability of the supply organization to function efficiently calls for co-ordination of its work with that of all the departments of the railways that it serves. Purchasing and stores officers and employees should be well informed concerning the problems and viewpoints of all other departments, and other departments, in turn, may well invite the counsel of purchasing and stores officers in studying problems the solutions of which are affected by supply considerations.

In view of the problems which face the railways, and the necessity for real team-work among all departments, it would seem that the officers of railway associations might well give consideration to the desirability of having the various associations represented in each other's meetings. The desirability of keeping railway associations working in harmony with each other is obvious, and they have an opportunity to use each other more effectively in correcting bad practices and promoting good practices.

How Some Railways Are Using Rail Motor Cars

WHEN the rail motor car was still in the experimental stage, it was generally believed that its principal utility would be in supplanting steam service on relatively short branch lines. The cars shuttled back and forth between the station at the end of the branch and the junction point with the main line. Usually one or two round trips afforded all the service that was necessary. The result was that the average daily mileage of the cars was low, and the savings effected, while considerable, were limited by the low mileage.

There is, of course, a definite use for rail motor cars in this class of service, but their utilization has gone

far beyond this modest beginning. Rail motor cars are now being used in an increasing variety of ways, and they are no longer confined to service on branch lines by any means. One railway uses a car for a daily run of more than 300 miles on its main line, to handle local passenger traffic, thus supplanting steam trains with a more flexible service, and also relieving the long-distance trains of numerous stops. There are many combination main and branch line cars serving local traffic on the main line, making a round-trip or two over one or more branch lines in the vicinity, and returning to the tie-up point over the main line. Other cars are used in main-line commuter service during the rush hours, and also for making branch line trips between times.

It is no longer a requirement that the cars return to their tie-up point every night. One railway operates a pool of three cars which cover a considerable section of the railway, making various trips and returning to the original tie-up point only every third day. Two or three of the short lines are even using the cars in mixed train service, picking up local freight cars in light traffic districts. Of course, in milk train service, rail motor cars have long since proved their efficiency. A significant development also is the successful operation of a de luxe rail motor car train by one railway, this train including an observation and club car, among other rail-motor-car equipment of the de luxe type.

Railways operating subsidiary motor coach companies have found the rail motor cars to be invaluable in supplying an intermediate service, where the traffic is too heavy for the coaches and too light for steam trains, or, in cases of light traffic, where good highways are not available.

In this manner, the utilization of rail motor cars has been vastly extended. Studies of the possibilities, coupled with ingenuity in the assignment of the cars, have brought the average mileage per day to high figures. Averages of from 200 to 300 miles are by no means uncommon, and one road, using rail motor cars in various kinds of services, averages 122 miles per day with all of its newer types of cars, including shopping periods, and several runs that are necessarily short.

Those who have not kept in touch with the rapid progress in this field will find, upon investigation, that vast improvement has been made, not only in the construction of better cars, but in their operation and utilization as well.

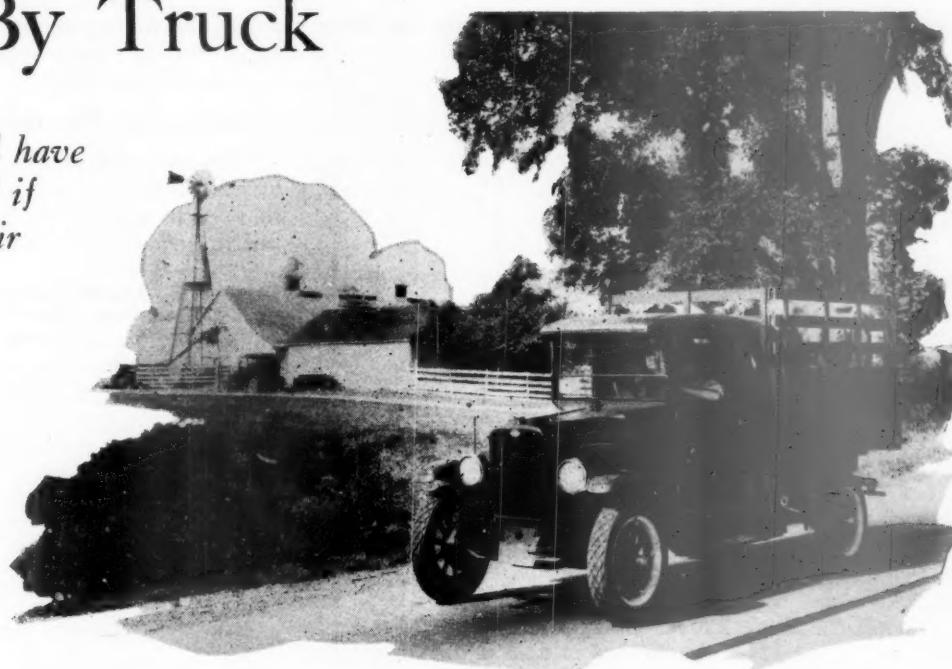
Indexes to Volume 88

THE indexes to the latest volume of the *Railway Age*, January to June, 1930, are now ready for distribution. Those desiring copies should advise the New York office, 30 Church Street.

Livestock Rates By Railroad Less Than By Truck

Illinois shippers would have saved \$400,763 in 1927 if they had forwarded their animals by rail

Motor Trucks Are Used As Feeders to Railroads And in Direct Competition



ILLINOIS livestock shippers would have saved \$400,763 if the 1,115,606 head of livestock shipped by truck to three markets in 1927 had been shipped by rail. Trucking charges on livestock to the three principal markets—Peoria, East St. Louis and Chicago—averaged, on the whole, from two to four times as much as railway charges for corresponding distances, and in some cases were as high as eight times the comparable rail charges. On the basis of the 1927 trucking and freight rates the apparent net saving made by shipping by rail instead of by truck would have been 34.4 cents a head. These facts are brought out in a study of livestock trucking rates made by R. C. Ashby, associate chief in livestock marketing of the agricultural experiment station of the University of Illinois and reported in the University bulletin No. 342.

The data collected in the report were secured from various sources, the principal ones being three large commission firms that furnished complete records of truck consignments for the full calendar year of 1927, and later for the month of December, 1928. The data for 1927 covered over 19,600 accounts from Peoria, over 12,000 from East St. Louis and more than 3,000 from Chicago. Supplemental data covering December, 1928, included over 2,000 consignments at Peoria, more than 2,000 at East St. Louis, and over 800 at Chicago. The livestock included in the records was 19.5 per cent, 14.2 per cent and 4.4 per cent, respectively, of the total truck deliveries of cattle and calves received at the three markets; 26.9 per cent, 15.4 per cent and 12.8 per cent of all trucked hogs; and 24.0 per cent, 11.8 per cent and 16.7 per cent of all trucked sheep.

The report states that, "to Peoria trucking rates per 100 lb. per mile in 1927 averaged 2.8 to 3.5 times the rail rates on cattle and calves, 2.1 to 2.7 times the rail rates on hogs, and 1.7 to 3.7 times the rail rates on sheep. To East St. Louis they averaged 2.3 to 4.2 times the rail rates on cattle and calves, 2 to 3.5 times

the rail rates on hogs, and 3 to 5.3 times the rail rates on sheep. To Chicago they averaged 2 to 8 times the rail rates on cattle and calves, 2 to 3.5 times the rail rates on hogs, and 1.6 to 4.5 times the rail rates on sheep. In calculating net marketing expense by rail 10 cents per 100 lb. was allowed for trucking from farm to market and 10 cents per 100 lb. for shipping association home expense.

"If one considers only truck shipments moving 45 miles or more, the apparent savings in marketing by rail instead of by truck, figured on the basis of the 1927 trucking and freight rates, would have been as follows:

To Peoria—53 cents a head, or 20 cents per 100 lb.
To East St. Louis—57 cents a head, or 25 cents per 100 lb.
To Chicago—26 cents a head, or 11 cents per 100 lb.

"On the basis of the December, 1928, trucking rates, which are lower than those in 1927, and the freight rates for the latter year, the apparent savings would have been:

To Peoria—38 cents a head, or 14 cents per 100 lb.
To East St. Louis—44 cents a head, or 19 cents per 100 lb.
To Chicago—15 cents a head, or 6 cents per 100 lb."

Although transportation charges represent the major expense in marketing livestock, the report considers other factors which modify the final transportation expense. These include (1) comparative risks; (2) terminal differentials in yardage and in commissions; (3) comparative shrinkage; (4) the attitude of buyers toward truck and rail shipments; and (5) convenience, which, though not directly measurable in terms of expense, is an important factor in determining the type of shipment used. In investigating the loss incurred during shipment, the data collected show a higher proportion of dead cattle in truck receipts than in rail at three markets out of five; a higher proportion of dead calves in rail receipts at four markets out of five and a higher proportion of dead hogs in truck receipts at

three markets out of five, irrespective of length of haul. Comparative losses in sheep are very similar. The accuracy of the count of dead and crippled stock shown in the truck receipts may be questioned since one of the best informed men at one of the leading markets is of

Table I.—Comparison of Truck and Rail Rates in Three Illinois Market Areas, 1927

Zone	Miles to Market	Peoria		East St. Louis		Chicago	
		Cattle and Calves		Truck	Rail	Truck	Rail
		Truck	Rail	Truck	Rail	Truck	Rail
1	12½	2.6	0.9	3.5	1.0	2.0	0.8
2	20	1.9	0.6	2.4	0.6	1.2	0.6
3	30	1.5	0.5	1.7	0.4	0.9	0.4
4	40	1.2	0.4	1.3	0.4	0.7	0.3
5	50	1.0	0.3	1.1	0.3	0.8	0.3
6	60	0.9	0.3	1.1	0.3	0.8	0.2
7	70	0.7	0.2	0.9	0.3	0.7	0.2
8	80	..	..	0.8	0.2	0.7	0.2
9	90	..	..	0.7	0.3	0.7	0.2
10	100	..	..	0.6	0.2	..	..
11	110	..	..	0.7	0.2	0.7	0.2
12	120	..	..	..	..	0.8	0.1
13	130	..	..	..	..	0.8	0.1
Hogs							
1	12½	2.1	1.0	2.7	1.1	2.6	0.9
2	20	1.6	0.7	2.0	0.7	1.2	0.6
3	30	1.3	0.5	1.6	0.5	1.1	0.5
4	40	1.1	0.4	1.1	0.4	0.8	0.4
5	50	0.9	0.4	1.0	0.4	0.7	0.3
6	60	0.8	0.3	0.9	0.3	0.7	0.3
7	70	0.8	0.3	0.8	0.3	0.6	0.3
8	80	..	..	0.7	0.3	0.7	0.3
9	90	..	..	0.7	0.3	0.7	0.2
10	100	..	..	0.6	0.2	0.6	0.2
11	110	..	..	0.7	0.2	0.7	0.2
12	120	..	..	..	..	0.5	0.2
13	130	..	..	..	..	0.4	0.2
Sheep							
1	12½	3.0	1.0	4.2	1.0	..	..
2	20	2.2	0.8	3.2	0.6	1.8	0.7
3	30	1.5	0.6	2.0	0.5	1.1	0.5
4	40	1.4	0.5	1.7	0.4	0.8	0.4
5	50	1.5	0.4	1.2	0.3	0.8	0.4
6	60	0.7	0.1	1.1	0.3	0.7	0.3
7	70	..	..	1.0	0.3	0.5	0.3
8	80	..	..	0.9	0.3	0.9	0.3
9	90	..	..	0.9	0.3	1.1	0.3
10	100	..	..	..	..	0.9	0.2
11	110	..	..	..	..	0.7	0.2
12	120	..	..	0.6	0.2	1.1	0.2
13	130	..	..	..	..	..	..

the opinion that the numbers are larger than actually appear on the records. A study of the livestock losses in truck and rail shipments, on the basis of equivalent mileage at two markets during July, 1929, revealed the following data:

Losses on Shipments of 100 Mi. or Less

	Truck Hogs			Ratio
	Number received	Number dead	Market 1	
Market 1	132,747	174	1:763	
Market 2	137,871	145	1:951	
Rail Hogs			Ratio	
Market 1	Number received	Number dead	1:2,888	
Market 2	43,318	15	1:3,467	
	31,202	9		

Insurance Rates Less by Rail

The report further explains that "a comparison of insurance rates applying to livestock shipped by truck and by rail, obtained from the Hartford Insurance Company, favors the shipments by rail. The rates in effect at several terminal markets are shown in Table II, but in comparing the rail and truck rates the reader should bear in mind the fact that the insurance company recovers from the railroad companies a certain proportion of its rail losses, shippers receiving full payment from the insurance company and assigning to it any claims they may have against the carriers. There is no similar recovery on losses by truck. Several states, however, now require commercial truckmen to provide insurance on all cargoes, nine states being listed thus far as having such requirements.

"At most terminal markets, somewhat higher yardage and commission rates are charged on truck consignments than on rail. Such differentials at the three Illinois markets covered in this study range from as low as 2 cents to as high as 20 cents a head. The rapid increase in truck shipments has brought problems to stockyard managements often entailing heavy expenditures for the rearrangement of existing facilities or for new construction.

Differences Per Head and Per Hundredweight

"The net differences in expense between marketing by rail and by truck in three areas studied, assuming that each species of livestock could have moved by rail in straight cars and at the freight rates applicable

Table II*—Sample Schedule of Insurance Rates Covering Losses from Death and Crippling of Livestock in Transit from Any Cause

(The rail rates quoted are general; truckage rates as listed apply at several markets but not at all)

Miles to market	Cattle and calves		Hogs		Sheep	
	Rail rates, cents per head	Truck rates, cents per head	Miles to market	Cattle and calves	Hogs	Sheep
Under 150	10	7	4	Under 50	12	8
151-300	12	9	4	50-75	15	10
301-750	15	11	5	75-100	18	12
751-1100	20	15	6	100-125	20	16
				125-175	22	18
				175-225	24	19
				225-250	25	20
						14

* Used with permission of Hartford Insurance Company, Livestock Department.

to that class of livestock, appear in Table III. To obtain the net expense by rail, 10 cents a hundredweight for shipping association home expense and another 10 cents for trucking from farm to railroad station were added to the freight rate. In addition, at Chicago, a terminal charge per car had to be added. To obtain the net expense by truck to a particular market, an amount equal to the higher yardage and commission on truck-ins at that market was added to the truck rate and also the expense of truck insurance per hundredweight. This affords figures giving comparable marketing expense all the way from the farm to the market and the difference between these totals shows the net difference between the two methods.

"A total net saving of \$46,951 would apparently have been possible on the number and weight of livestock included in this analysis if all the stock had been marketed in straight earloads by rail and 10 cents a hundredweight had been charged for local shipping association home expense and 10 cents a hundredweight for trucking from farm feedlot to local railroad loading point. Since this study covers a total of 136,307 head of livestock, the apparent possible saving would have been 34.4 cents a head, or, adjusted to the lower rates in effect in December, 1928, 24.9 cents.

Trend of Truckage Rates

"Conversations with truckmen indicate a realization on the part of many that rates are now so low in many instances as to preclude satisfactory profit on the present basis of operation. Many truckmen say that on the basis of current livestock rates their margin of profit is dependent largely upon the development of a back-haul business. In at least one area livestock trucking appears to be stabilizing on that basis, and concentrating largely in the hands of a few operators.

"Obviously further changes in livestock truckage rates will be influenced directly by the degree to which back-haul business is developed for trucks moving live-

Table III.—Apparent Net Savings in Marketing Livestock by Rail Instead of by Truck,
Three Illinois Market Areas, 1927*

(Cents per 100 lb. and per head)

Zone	Peoria						East St. Louis						Chicago					
	Cattle and calves		Hogs		Sheep		Cattle and calves		Hogs		Sheep		Cattle and calves		Hogs		Sheep	
	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head	Per cwt.	Per head
1	5.6	28.7	5.0	11.8	13.3	11.8	15.5	80.5	8.6	21.2	29.3	19.6	—3.9	—36.3	6.7	14.2	—3.2	10.1
2	10.8	55.8	9.4	22.5	16.6	15.8	18.5	93.5	15.1	31.4	39.2	30.3	—5.0	—44.7	—1.3	—1.3	8.4	8.4
3	14.3	69.3	14.9	35.9	16.1	17.5	22.7	119.1	22.2	46.7	35.6	29.8	—5.0	—49.7	5.9	15.7	6.0	5.1
4	18.3	93.9	19.2	45.3	26.9	26.5	21.5	105.4	17.8	38.6	41.0	30.1	—3.2	—32.6	1.6	4.1	5.0	5.2
5	20.0	111.9	19.2	45.7	44.9	44.9	23.3	92.2	22.2	45.3	33.7	26.2	6.9	60.0	3.4	8.7	8.6	7.3
6	21.8	120.3	20.8	47.2	6.8	4.3	33.4	110.2	22.2	45.6	36.3	28.5	13.3	111.2	13.8	35.0	10.8	9.1
7	17.9	32.2	28.3	73.0			31.2	140.6	23.4	57.0	39.7	35.6	10.7	88.3	13.6	34.9	4.8	4.9
8	...	...	...	...	...	...	31.2	126.5	21.0	44.2	42.4	33.1	21.8	163.9	25.5	66.7	42.3	36.4
9	...	...	...	...	...	...	23.2	104.4	21.0	44.2	42.4	33.1	21.8	163.9	25.5	66.7	42.3	36.4
10	...	...	...	...	...	...	27.3	177.8	27.7	56.9	...	...	...	...	32.6	71.7	58.4	56.9
11	...	...	...	...	...	...	38.7	257.3	44.7	93.1	...	...	39.9	415.8	43.9	80.5	46.9	40.0
12	...	...	...	...	...	...	...	...	...	40.8	25.1	62.7	96.0	23.8	67.0	95.0	65.6	...
13	...	...	...	...	...	...	...	...	...	...	...	67.1	98.0	17.4	40.5	106.9	75.8	...

* Based on 1927 truckage rates, with adjustments

stock to market. Many farmers mention the convenience and economy of the back-haul service as an important reason for their growing patronage of livestock truckage. Organized trucking by co-operative livestock shipping associations has received increasing attention in the last two years and instances of its success are numerous."

In discussing the possibility of the railroads entering the livestock trucking-field either by providing local truck-in service to shipping points or by putting on truck service direct to market, the report states that definite developments in those directions have not as yet appeared in the livestock field. However, railroads do use motor trucks, more than 72 railroads now using trucks to supplement regular shipping service, 46 in terminal operations, 15 in the form of store-door delivery and 11 to replace local freight trains.

* * *



Interior of One of Four New St. Louis-San Francisco Dining Cars, Built by the Pullman Car & Manufacturing Corporation

The cars are equipped with steel furniture and finished in three-tone green. The radiators are concealed below the windows, with grills in the window sills. The ceiling lights are concealed behind the ceiling molding.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT car loading in the week ended August 9 showed a further decrease of 14,000 cars as compared with the previous week to 904,157 cars, which was 187,996 cars less than the loading in the corresponding week of last year and 140,011 cars less than that of the corresponding week of 1928. The figures have been showing an almost steady decline since the week ended May 3 at a time of the year when increases are normally reported from week to week. All classes of commodities participated in the reduction, miscellaneous loading showing a drop of 78,942 cars as compared with last year. All districts reported decreases as compared with both previous years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, August 9, 1930

Districts	1930	1929	1928
Eastern	199,001	245,149	239,332
Allegheny	181,811	225,257	212,775
Pocahontas	51,407	63,003	57,593
Southern	118,004	141,711	143,255
Northwestern	143,725	180,451	157,121
Central Western	138,823	155,790	155,766
Southwestern	71,386	80,792	78,426
Total Western Districts	353,934	417,033	391,313
Total All Roads	904,157	1,092,153	1,044,268
Commodities			
Grain and Grain Products	61,360	64,211	58,024
Live Stock	20,225	22,054	23,680
Coal	131,612	158,467	161,229
Coke	8,261	11,951	9,337
Forest Products	40,672	68,542	66,012
Ore	58,207	78,953	60,557
Merchandise L.C.L.	234,040	259,253	257,018
Miscellaneous	349,780	428,722	408,411
August 9	904,157	1,092,153	1,044,268
August 2	918,335	1,105,920	1,048,821
July 26	919,349	1,102,553	1,034,326
July 19	928,256	1,079,968	1,033,843
July 12	915,985	1,066,414	1,024,925
Cumulative total 32 weeks	28,585,529	32,975,104	30,498,903

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 9 totaled 61,272 cars, an increase over the previous week of 3,197 cars and a decrease of 4,173 cars from the same week last year.

Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada	
August 9, 1930	61,272
August 2, 1930	58,075
July 26, 1930	59,372
August 10, 1929	65,445
Cumulative Totals for Canada	
August 9, 1930	1,884,525
August 10, 1929	2,119,965
August 11, 1928	2,066,303
	1,093,801
	1,334,971
	1,245,243

Modern Methods Used in Grading

STIMULATED by extensive programs of highway construction, grading equipment has received an unusual amount of attention in recent years. While developments in this type of equipment and in grading methods have been quite general over the country, some of the latest and most striking innovations have taken place in the West, as is evidenced by the equipment and methods employed recently on two large construction projects of the Southern Pacific. On these two projects, one a yard, and the other the approaches to a new bridge, which together involved over a million cubic yards of grading, some of the equipment used is not only entirely new in railroad work, but of greater capacity than anything used heretofore in this work, except car equipment moved over a track.

The newest of the equipment used on the Southern Pacific work includes all-welded steel dump carts of 16 cu. yd. capacity, hydraulically and winch-operated scrapers of 7 yd. capacity, electrically-operated scrapers of 11 yd. capacity, and powerful scarifiers or rooters for breaking up earth or hard-pan in advance of scraper operation. Other equipment included 60-hp. caterpillar tractors for hauling this equipment, hydraulically and winch-operated bulldozers, 6 to 9-yd. motor trucks and large capacity Diesel and electric shovels and cranes. Using this equipment, the yard grading was completed 30 days in advance of a schedule of 120 days, and the bridge approach work is nearing completion considerably ahead of the date set.

The yard grading was done in preparation for a new freight terminal at Fresno, Cal., which extends over an area 650 ft. wide by 2 miles long, and involved about 239,000 cu. yd. of grading. The bridge approach grading is for the new double-track bridge across Suisun bay, about 30 miles east of San Francisco, on the main line to the east. Altogether, about five miles of new main line construction was necessary at this point.

16-Yd. Dump Carts Were Used

The equipment used at Fresno and on the bridge approaches was not only unusual in many respects but proved highly effective in carrying out the work. One of the most interesting units of equipment employed was the large dump carts. These carts are of all-steel construction and consist essentially of a large V-shaped hopper body mounted on two wheels, with a tail gate on the rear side to discharge the load. The body itself is constructed of heavy steel plates with welded joints throughout and has a top opening of 10 ft. 8 in. by 10 ft. 4 in. With a depth of 5 ft. 6 in., this body has capacity for about 16 yd. of material as received from the shovel, or a pay load of from 12 to 13 yd., depending upon the swell of the material.

The tail gate, which provides an opening 8 ft. 8 in. wide by 5 ft. high, is also of steel plate construction, and swings outward at the bottom on hinges at the top. When closed, the gate is held by a latch which can be tripped by either the man operating the hauling equipment or by a man on the dump. When the latch is

Powerful and up-to-date equipment of unusual capacity speeds two large projects on the Southern Pacific

tripped, the gate swings outward under the weight of the load, and can be allowed to swing open wide, dumping in a pile, or can be chained to any desired opening to spread the material as the cart is moved forward. Owing to the balance given to the gate, it swings shut from its own weight and latches automatically when the load has been discharged. The wheels of the cart are of the disc type, 78 in. in diameter, and have 30-in. flat treads. These wheels are mounted on 5½-in. spindles of heat-treated chrome vanadium steel, and are equipped with heavy-duty Hyatt roller bearings. The assembled cart weighs approximately 14,000 lb.

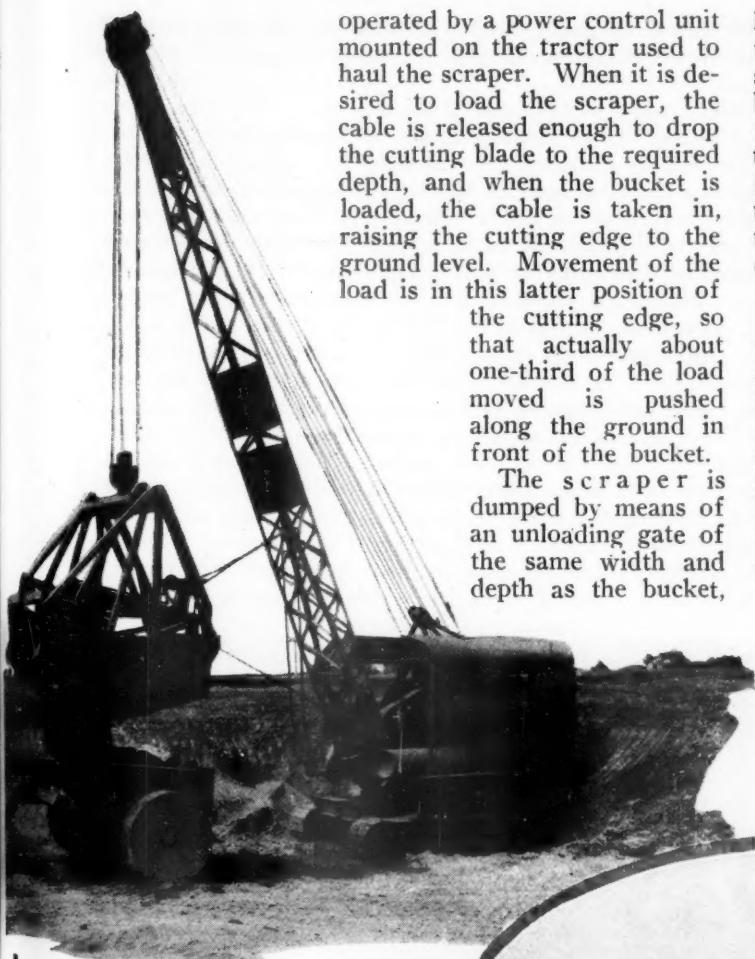
While not used on either of the two grading jobs under consideration, these carts are also available with a caterpillar mounting, developed specifically for use where the ground is unusually soft. The tracks of this type of mounting are 7 ft. 2 in. long and 20 in. in width. So equipped, the cart has a weight of about 16,000 lb.

Seven and 11-Yd. Scrapers

Two types of scrapers were used in the grading work; one a rigid type of 7-yd. capacity, and the other a telescoping type with a capacity of about 11 yd. The 7-yd. scraper, which, like the dump carts, is of welded construction throughout, consists essentially of a large bucket and an unloading gate mounted in a rather unusual way on four wheels. The bucket itself is 10 ft. wide, 5 ft. deep and 4 ft. high, and is provided throughout its width with a cutting blade of hardened tool steel. The front of the bucket is carried by a frame of goose-neck construction, which leads to the front wheel axle, while the rear of the bucket has a connection on each side pivoted to a special frame, which forms a cantilever mounting for the rear wheels. The height of the bucket above the ground is determined entirely by the position of the pivoted frame carrying the rear wheels, which is controlled by the movement of a compression beam. This beam has a pivoted connection to the top of a post lever in the center of the rear frame, and has a sliding connection on the goose-neck frame in front.

Movement of the beam is by means of hoisting cable





Above—A Seven-Yard Hydraulically Operated Clam-Shell Bucket Was Used Successfully in the Yard Grading

Right—Dumping and Spreading a 16-*yd.* Load at Fresno

which is supported by an arm suspended from an "A" frame over the bucket. This gate, which can be swung forward and backward, is pushed to the rear of the bucket as loading takes place, and is pulled forward by a cable when unloading. Thus, when it is desired to unload the scraper, the cutting blade is raised to the desired depth of spread by taking in on the bucket hoist cable, and the gate is pulled forward through the bucket by the gate-operating cable.

The wheels of the scraper are of the disc type, the front wheels being 36 in. in diameter, with an 18-in. tread, while the rear wheels are 48 in. in diameter with the same width of tread. All four wheels are mounted on 4½-in. heat-treated chrome vanadium steel axles and are equipped with Timken bearings. The total weight of this type of scraper is approximately 14,000 lb.

The 11-*yd.* telescoping type scrapers which were employed on part of the work operate on an entirely different basis. This unit, which is carried on a caterpillar mounting, consists of a stout all-welded steel frame, carrying a telescoping bucket. The bucket, which is the special feature of the scraper, is rectangular in shape, and consists of a fixed front section equipped with a

operated by a power control unit mounted on the tractor used to haul the scraper. When it is desired to load the scraper, the cable is released enough to drop the cutting blade to the required depth, and when the bucket is loaded, the cable is taken in, raising the cutting edge to the ground level. Movement of the load is in this latter position of the cutting edge, so that actually about one-third of the load moved is pushed along the ground in front of the bucket.

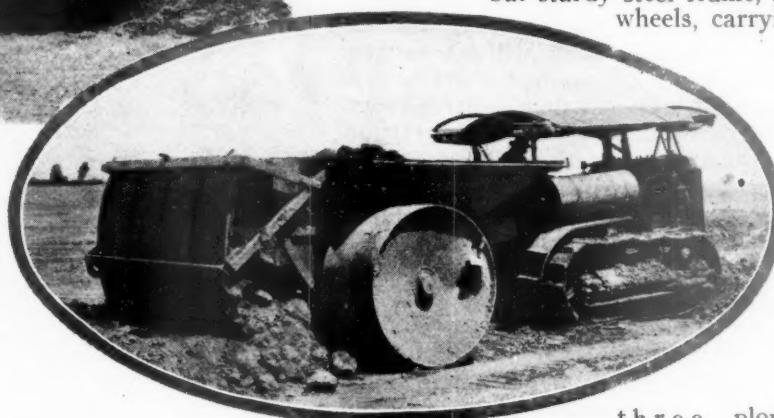
The scraper is dumped by means of an unloading gate of the same width and depth as the bucket,

hardened steel cutting edge, and three moveable sections, which can be moved backward and forward, telescoping within each other. The frame carrying the bucket can be raised and lowered as desired, and, therefore, when loading, it is only necessary to lower the cutting edge into the ground and allow the bucket to fill as it is moved forward. In discharging the load, the cutting edge is raised to the height of spread desired and the bucket sections are telescoped, forcing the material out of the bucket over the cutting edge.

The scraper buckets are operated by electric power furnished by two motors, which transmit their power through gears and ratchet and pawl arrangements. One of the motors supplies the power for raising and lowering the bucket frame, and the other the power for telescoping and opening the bucket sections. In the case of certain of the 11-*yd.* scrapers used, electric current for operating the motors was obtained from a gasoline engine-generator set mounted on the rear of the scraper frame, and in other cases, the current was secured from a generator mounted on the tractor employed to haul the scraper.

Scarifiers Built For Heavy Work

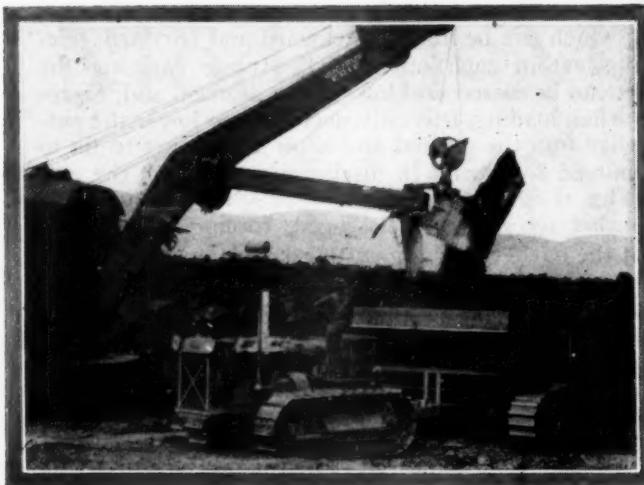
The scarifier used on the Southern Pacific work is not an entirely new unit of grading equipment, but up to the present time it has not been used to any extent in railroad grading operations. This unit of equipment consists essentially of a relatively simple but sturdy steel frame, mounted on two wheels, carrying from one to



three plowing standards which can be lowered into the ground to any depth desired. The frame of this unit is of all-welded construction, and consists essentially of two main parts; the body proper, with a tongue to the draw bar, and a special throw arm rig of box-beam construction, which has a pivoted connection to the body on each side and carries the wheels.

The wheels of the scarifier, which are of the disc type, are 36 in. in diameter and have 12-in. treads. These wheels are mounted on axles of heat-treated alloy steel, located at the forward junctions of the members forming the triangular sides of the throw arm rig. Having a pivoted connection to the body of the scarifier, or forward movement of the top of the throw arm rig raises the rear end of the body, and with it the standards, while a backward movement of the top of the rig lowers the rear end of the body and the standards.

The standards of the scarifier, which are sloped forward and extend 28 in. below the frame, are of heat-treated alloy steel with specially designed points. These points are made of a material of unusual hardness and it is said that they can be worn down to their bases without requiring sharpening. The standards fit into slots in the scarifier frame, and are held up by a 2¾-in. steel pin. In the case of the units equipped with three



One of the Dump Carts on a Caterpillar Mounting With Top Boards That Increase Its Capacity to 21 Cu. Yd.

standards, the distance between outside standards is 90 in.

Raising and lowering of the frame, and thereby the standards, is accomplished by taking in and letting out a cable which has a fixed hitch about midway the length of the carriage tongue, and which passes over a single sheave at the top of the overhead throw arm rig. Operation of the cable is effected by a hoisting unit on the tractor used to haul the scarifier, and can be controlled by the tractor operator without leaving his seat.

For a time a hydraulically-operated scarifier with one standard was used on the Fresno yard work for breaking up the hardpan encountered. This was of substantially the same type of construction as the cable-operated unit, except that the frame carried a gasoline engine and an oil compressor, and the throw arm rig was moved backward and forward by means of a piston operating in a pressure cylinder.

Special Hitch and Control Unit Provided

All of the various units described, the dump carts, the scrapers and the scarifiers, were pulled by 60-hp. caterpillar tractors, equipped, in most instances, with two special attachments designed specifically for use with this grading equipment. These attachments consisted of a special tractor hitch and a power control unit. The former of these is an arrangement of alloy steel parts with a drawbar and a full universal joint with hardened steel bushings. The drawbar of the unit has a vertical jaw opening of 14 in. and is fitted with a long steel sleeve through which the king pin is inserted. This arrangement was designed to minimize the tendency to bind at the drawbar with the movement of the tractor or hauled unit over uneven ground.

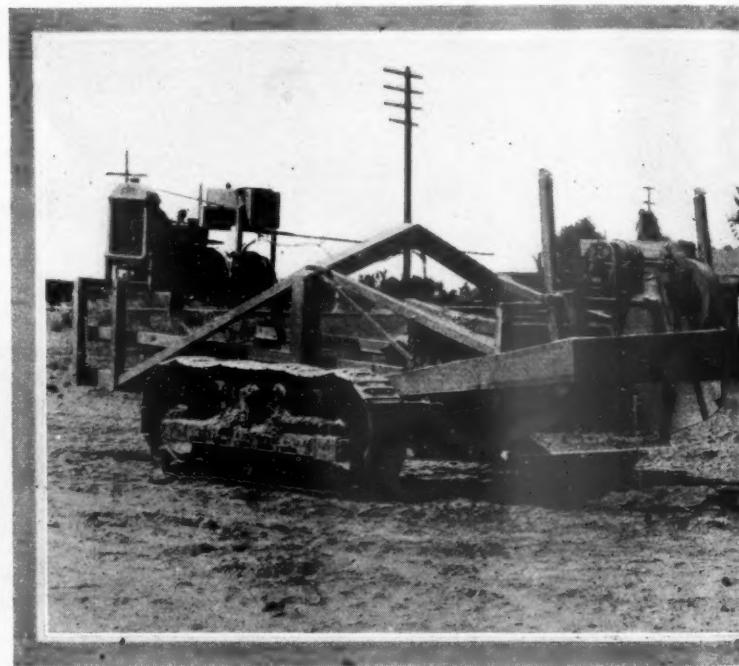
The power control unit, which is used for the cable operations of the 7-*yd.* scraper and the cable-operated scarifier, is a special hoisting device, which is mounted on the rear of the tractor, just above the tractor hitch. This is a relatively simple unit, designed for the operation of either one or two cables, and consists essentially of a shaft, and either one or two cable drums driven by friction. The shaft of the unit is mounted on Timken bearings and is connected to a special take-off on the tractor motor through a set of helical cut bevel gears running in oil. The cable drum in each case is mounted on this shaft, on roller bearings, and is driven by friction controlled by a hand lever near the tractor opera-

tor's seat. A push on this lever causes the cable to wind in on the drum, and a pull on the same lever allows the cable to feed out. A brake on the control unit holds the cable in any desired position.

Owing to the pivoted connection between the tractor and the unit hauled, provided in the tractor hitch, the power control unit is located immediately above the drawbar, and the cables from the drums are, in each case, made to pass over a sheave, which is swiveled close to the drawbar pin. Through this arrangement, turning of the tractor out of line with the unit hauled does not materially affect the length of the cable.

Bulldozers were also used effectively on the grading work, the type employed consisting primarily of a pushing and scraping blade with end pieces and side beams of box-section construction, hinged at the rear sprocket shaft of the tractor. No drilling of holes is required for the installation of the type of bulldozer used, and it can be removed from a tractor or reinstalled in a few minutes.

In order to support the blade and to control its movement, a substantial steel "A" frame is mounted on the



Tractor Hauling an 11-*yd.* Telescopin Scraper

front of the tractor and carries a pair of sheaves over which a cable passes from the blade to the power control unit at the rear of the tractor. This frame can be left attached to the tractor throughout grading operations without interfering with the use of the tractor for other than bulldozer work, and where this is done, the tractor can be returned to bulldozer operation in a minimum of time.

Caterpillar Tractors Did Heavy Hauling

Sixty horse-power caterpillar tractors were used to haul the grading equipment described. These units, which were specially designed for heavy traction service, have a four-cylinder, four-cycle, water-cooled, valve-in-head-type gasoline motor, which drives the two caterpillar tracks, each of which has a traction area 6 ft. 7 1/2 in. by 20 in., when equipped with 20-in. shoes for grading work. These tractors have three forward speeds and a reverse and can operate up to 1.9 m.p.h. in first speed, 2.6 m.p.h. in second speed, and 3.7 m.p.h.

in third speed. In reverse they can operate at 1.4 m.p.h. The approximate weight of the tractors is 20,300 lb.

In addition to the standard equipment of the tractor units, a number of special features can be furnished with them, which adapt them particularly to different classes of grading work. Some of the more important of these features which were added to certain of the tractors on the Southern Pacific work included a power take-off at the rear, which was used to operate the power control unit; electric floodlighting equipment, including the floodlight fixtures and a generator driven by the tractor motor; a high-speed gear by means of which a forward speed of 4.4 m.p.h. can be attained; and a hydraulic pump for use in conjunction with oil cylinders on various types of lifting devices.

Other main units of equipment used on the grading work included motor trucks and various types and capacities of shovels and cranes. The trucks were of several makes and were equipped with power dump bodies capable of handling about 6 cu. yd. of material. The shovels and cranes were of the Diesel and electric

material, practically all of the excavation at Fresno was in hard-pan.

The equipment used on this work included 13 caterpillar tractors, five 12-yd. dump carts, four electrically-operated 11-yd. scrapers with telescoping buckets, two cable-operated 7-yd. scrapers, one hydraulically-operated scarifier, a 1½-yd. Diesel shovel and a crane. Both of the latter units, which were mounted on caterpillar tracks, were used in the heavier excavation work and loaded the material into the two wheel carts.

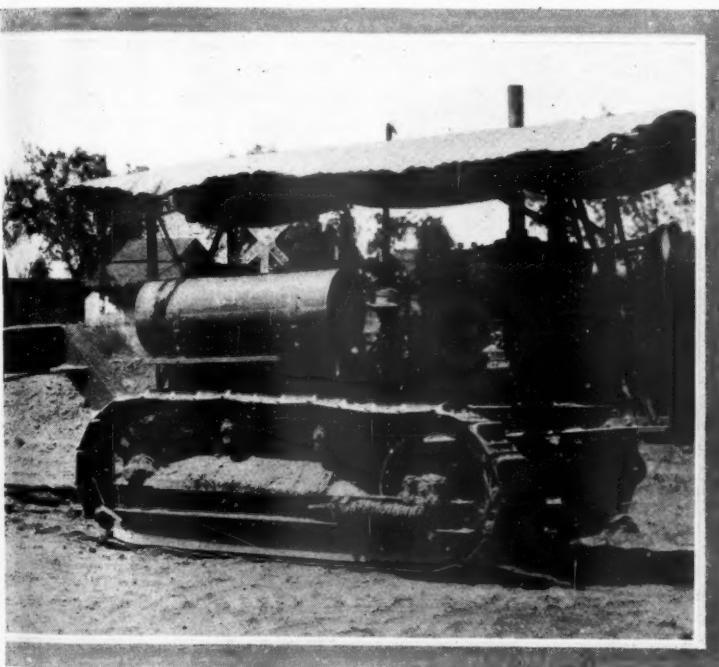
In speeding up loading operations, the shovel was equipped with a 2½-yd. dipper bucket, replacing the 1½-yd. standard bucket equipment, and a specially designed 7½-yd. hydraulically-operated clamshell bucket was used with crane. This latter piece of equipment, which proved particularly effective in loading the large capacity wagons, especially when working in the lighter material, was operated by hydraulic equipment mounted on the crane and connected to the bucket by a system of steel piping with flexible joints.

For the lighter excavation work at Fresno, the material was plowed up by the hydraulically-operated scarifier, and was then picked up and distributed by the 7-yd. and 11-yd. scrapers. The scrapers were also used for all smoothing-up operations and made unnecessary the use of bulldozers or other leveling equipment for this work.

The dump carts on the Fresno work carried the brunt of the hauling. These units, with a pay load capacity of 12 yd., were consistently loaded with 16 yd. of loose material, and in several cases their capacity was increased to 21 yd. by the addition of side boards around the top of the body. They were hauled readily over any character of ground by the tractors at speeds up to about 3½ m.p.h., and dumped and spread their loads without manual assistance on the fills.

Several features of the dump wagons proved particularly effective in the grading work. One of these is the sturdy body construction and the large opening at the top of the body, which made it possible to cast the dirt from the shovel or crane without the usual care in spotting the bucket for unloading. Another feature is its two-wheel construction, which made it particularly mobile, especially when being backed up; and still other features are its heavy weight of about 30 tons when loaded, and its wide wheel treads of 30 in., which made the carts effective in compacting the fills as made.

At Fresno, the grading was carried on day and night in two 10-hr. shifts, floodlights being provided on all



With Engine Generator Set on the Rear

types and except for a few special attachments and alterations, were similar to those commonly used in heavy grading operations.

Details of Grading at Fresno

Grading for the yard at Fresno and for the north approach to the Suisun Bay bridge was done by the same contractor and although the problems were entirely different in character, the same type of equipment was used.

At Fresno, where the excavation amounted to about 239,000 cu. yd., it was largely a problem of leveling off a large tract of land, 650 ft. wide by two miles long, with maximum cuts of 8 ft. and maximum fills of 5 ft. Unfortunately, the leveling was largely from one end of the yard toward the other, rather than crosswise of the 650 ft. This greatly increased the length of haul, the longest being about 1½ miles, and the shortest about 1,000 ft. Except for the top soil, which was of a relatively light sandy ma-



A 60-hp. Caterpillar Tractor Hauling a 7-yd. Cable-Operated Scraper

of the equipment for night operation. The entire force in each shift averaged 22 men, sufficient only to keep the available equipment in operation and repair. With the equipment mentioned and this relatively small force, the entire grading was completed in 90 days under a contract which allowed 120 days.

Heavy Grading on North Bridge Approach

The approach on the north side of the Suisun Bay bridge extends along the east face of a bold bluff, and the grading here involved a series of large cuts and fills, practically all of the cutting being in a more or less disintegrated shale and sandstone, some of which required shooting to break it up. The entire grading on this side amounted to about 500,000 cu. yds.

The two tracks of the north approach will cross over the original main line tracks along the foot of the bluff and, after paralleling the old tracks for several hundred feet, the eastbound track will drop off on a grade of about two per cent to a connection with the old eastbound main, while the westbound track will extend

about 3 yd., and a reinforced boom on the shovel to increase its strength for the heavy cutting encountered. Another feature in connection with the shovel was the lengthening of the shovel teeth to secure greater cutting action. This was done by welding a specially hardened steel plate on each tooth, the plates being 5 in. long, 1½ in. thick and 5 in. wide, and having beveled cutting edges.

The equipment on the north approach work was used in much the same manner as at Fresno, the shovel and wagons doing the heavier moving and the scrapers the lighter moving and the smoothing-off work. The bulldozer was also effective in this latter work, but especially in distributing material dumped from the 16-yd. carts. The rooter was used successfully on a part of the work, increasing the effectiveness of the scrapers, but at many places it was ineffective because of the rock encountered.

As at Fresno, grading continued night and day in two 10-hr. shifts, but on the north approach work an average of only 18 men were employed on each shift.



The Single-Standard Pneumatically-Operated Scarifier Used at Fresno

downward on a long approach grade of 0.45 per cent maximum, to a connection with the old westbound main, over a mile from the bridge. The largest cut on the north approach was made near the bridge and amounted to about 170,000 cu. yd., while the largest fill, which lies between 8,000 ft. and 12,000 ft. from the bridge on the westbound approach track, required the placing of 180,000 cu. yd. of material. A second fill of about the same size was avoided on the westbound approach track through the construction of an 1,860-ft. deck plate girder viaduct on steel towers, over a low marshy area. All cuts were made with side slopes of 1 to 1, and all embankments with slopes of 1½ to 1.

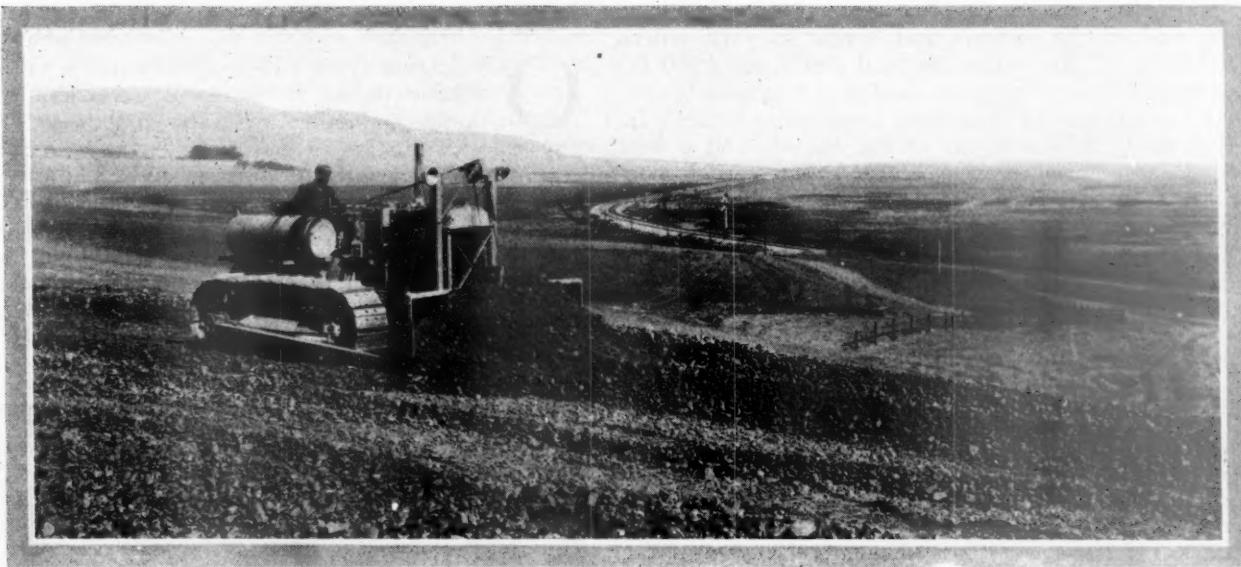
The equipment used in the north approach grading consisted of seven caterpillar tractors, five 16-yd. dump wagons, one cable-operated 7-yd. scraper, one cable-operated rooter with three standards, one bulldozer, and a 2-yd. Diesel shovel. Special features of the equipment included side boards on some of the dump wagons to increase their carrying capacity; 12-in. side boards on the shovel bucket, increasing its capacity to

All fills were built up in layers of about five feet and each successive layer was compacted by the equipment moving over it before the next layer was added. Following this method, no subsidence occurred in even the highest fills on the north approach. The length of haul on this work ranged from a few hundred feet to about 4,000 ft., and the output of the equipment for each 20-hr. day ranged from 3,000 to 5,000 cu. yd. During a large part of the work, the daily average was in the neighborhood of 3,750 cu. yd.

Throughout all of the work at Fresno and on the north approach to the bridge, the contractor had three electric welding and cutting outfits on the job, with which repairs were made to all of his equipment. The welding equipment was also used extensively for building-up and tipping cutting edges and teeth with special wear-resisting steel.

Motor Trucks Were Used on South Approach

In constructing the south approach, which is about 8,000 ft. long and on a maximum grade of one per cent,



A Bulldozer at Work on the North Approach to the Suisun Bay Bridge

compensated for curvature, about 400,000 cu. yd. of grading was necessary. Except for two sizable cuts near the bridge, this approach is on a fill which has a maximum height of about 40 ft. Of the material required for the fill, about 100,000 yd. was secured from the two cuts, and the remainder was secured from a large borrow pit located about two-thirds the way up the approach. The material in the cuts and the borrow pit was a compact sandy clay, which it was found advisable to shake up with light charges of black powder to speed up the shovel operations.

One of the biggest problems in the grading of this approach was the constructing of the fill over a long stretch of marshy ground, which would not support the embankment without extensive settlement. Throughout this area, the original soil was pushed up in high mounds on each side of the fill as the grading progressed, the disturbance extending as far out as 200 ft. from the fill at certain places. At one point the

soft marshy clay was excavated from the alignment of the fill to a depth of about 20 ft., down to a stable material, and the hole formed was backfilled with borrow-pit material to form a stable foundation for the fill. The soft material excavated was thrown to the outside of the curved alignment at this point to form a buttress or shoulder for the outside slope of the fill. In all, about 50,000 cu. yd. of material was lost in subsidence throughout the marshy territory, but the fact that this was expected is evinced by the fact that the total yardage in subsidence was within five per cent of that estimated in advance by the Southern Pacific engineers.

All of the grading work on the south approach was done with two two-yard electric shovels and a fleet of auto trucks with six-yard power dump bodies, supplemented only by the part time use of a caterpillar type crane and two tractors equipped with bulldozers. Numerous records of the output attained with this equip-



Excavating Marsh Material From the South Bridge Approach Ainement With Cranes Equipped With Dragline and Clam-Shell Buckets

ment were recorded during the work. In one instance, where one of the shovels and seven six-yard trucks were employed, and where the haul was about 2,500 ft., an average of one truck was loaded per minute by the shovel for a period of over three consecutive hours. In another instance, where one of the shovels and a fleet of trucks were used, it was recorded that a truck load left the shovel every 65 seconds for a continuous period of nine hours. In this latter case, the normal two-yard bucket of the shovel was increased to $2\frac{1}{2}$ yd. capacity by the addition of side boards, and in the same manner, the capacity of the trucks was increased from six yards to about eight or nine yards.

These examples indicate the speed with which the shovels were operated, and also the speed with which the trucks were able to get over the ground and discharge their loads. Turning of the trucks on the end of the fill was facilitated by the use of a manually-operated turntable, which was moved forward as the fill advanced. Loaded trucks were run on the table, and after being turned, were backed out to the edge of the fill and dumped.

In making the high fill of the south approach, the material was built up in layers of about four feet and thoroughly wet down to reduce subsidence to a minimum. About 40,000 gal. of water was sprayed on the fill each day during the major part of the work. Spreading of the material and smoothing-up work were done with the bulldozers, and a finish was given to the side slopes of the fill by dragging a pair of old rails up the slopes with the crane.

Shortly after completion, the entire fill was coated to a depth of about $1\frac{1}{2}$ in. with a hot road oil to give it a waterproof surface and to prevent washing of the side slopes, which would have been inevitable otherwise. In doing this oiling, a wagon-type road oiler was used on the top of the fill, and a hose with a spray nozzle was used on the slopes. In the latter case the oil was applied under a pressure of 28 lb. Altogether, about 35,000 gal. of oil was used on the fill.

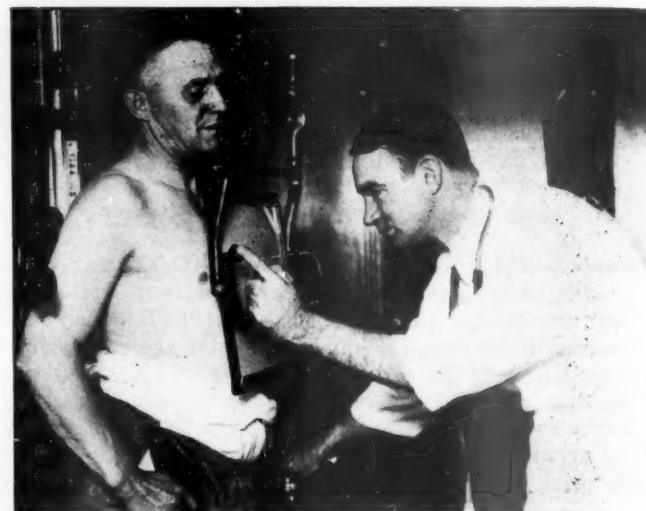
The grading for the south approach to the bridge was done by George Pollock Company, Sacramento, Cal., and for the north approach by R. G. Le Tourneau, Stockton, Cal., and was carried out under the direction of C. R. Harding, assistant to the president, and W. H. Kirkbride, engineer maintenance of way and structures of the Southern Pacific. Direct supervision of the work in the field was in charge of H. I. Benjamin, assistant engineer. The grading work at Fresno was done by R. G. Le Tourneau under the general direction of Mr. Kirkbride, and under the direct supervision of F. A. Bordwell, division engineer of the San Joaquin division.

The grading equipment used on the two jobs included Marion, Koehring and Bucyrus-Erie shovels, several makes of cranes, and Sterling, White and Mack trucks. All of the tractors were manufactured by the Caterpillar Tractor Company, and the special grading equipment, including the 16-yd. dump carts, the 7-yd. scrapers, the scarifiers and the bulldozers, was manufactured by the Le Tourneau Manufacturing Company, Stockton, Cal. The 11-yd. telescoping spreader is now manufactured by the Kaiser Paving Company.

A SIX-CAR TRAIN of multiple unit cars for use in the electrified suburban zone of the Delaware, Lackawanna & Western in northern New Jersey was exhibited on track 10 of the Lackawanna's Hoboken, N. J., passenger terminal on Thursday and Friday, August 21 and 22.

Milwaukee Builds Medical Car

ON August 4, the Chicago, Milwaukee, St. Paul & Pacific placed in service a car equipped with X-ray and other apparatus to be used for the physical examination of employees engaged in train operation and applicants for this service. The car, which was constructed in the shops of this company, is being operated on the lines east of Mobridge, S. D., under the supervision of the surgical department and will be used to supplement the work now performed by the railroad's physicians and surgeons. The exterior of the car resembles a steel sleeping car, while the interior is divided into a series of compartments provided with modern



An Engineman of the Olympian Being Examined Under the Fluoroscope

equipment necessary for complete physical examinations. Living quarters, including a dining room, a kitchen and shower baths, are furnished for the medical staff. A first aid room, in which an X-ray machine is located, and an office wherein employees' records and the findings of the examining board are carried, are also included. An electrical plant, located under the car, provides current for the X-ray and other apparatus.

The car has been named Metz in honor of Dr. A. R. Metz, chief surgeon of the Milwaukee, who sponsored the operation of the car as a means of promoting greater



Two Dressing Rooms Separate the Reception and Examining Rooms

efficiency among employees whose physical condition is an all-essential factor in the safe operation of trains. In addition to contributing to the safe operation of trains, it will give the employees now in service an opportunity to learn of latent physical defects at a stage that permits of their correction, thus keeping them in the best of health, and at the same time prolonging their period of usefulness. The facilities on the car are expected to further increase the effectiveness of examinations of train-service employees and applicants for such service, who have been examined heretofore by local members of the railroad surgical staff residing in communities along the railroad.

Freight Commodity Statistics

WASHINGTON, D. C.

THE total freight traffic handled by Class I railroads in 1929 amounted to 2,451,601,084 tons, as compared with 2,361,622,636 tons in 1928, according to the Interstate Commerce Commission's annual compilation of freight commodity statistics, which represents the total of the figures shown in its quarterly reports, as corrected. The 1929 figure is less than that for 1926, which was 2,465,368,606 tons, but is otherwise greater than that for any year reported. The tons of freight originated were 1,339,091,007, which exceeds the 1926 figure of 1,336,142,323 and also represents an increase of 4.44 per cent as compared with 1928. Products of agriculture showed a decrease of 2.20 per cent in tonnage originated as compared with 1928, animals and products showed a decrease of 2.83 per cent, products of forests a decrease of 1.92 per cent, and l.c.l. freight a decrease of 2.29 per cent, while products of mines showed an increase of 6.14 per cent and manufactures and miscellaneous freight an increase of 6.52 per cent. The New England and Southern regions also reported decreases, while all others reported increases.

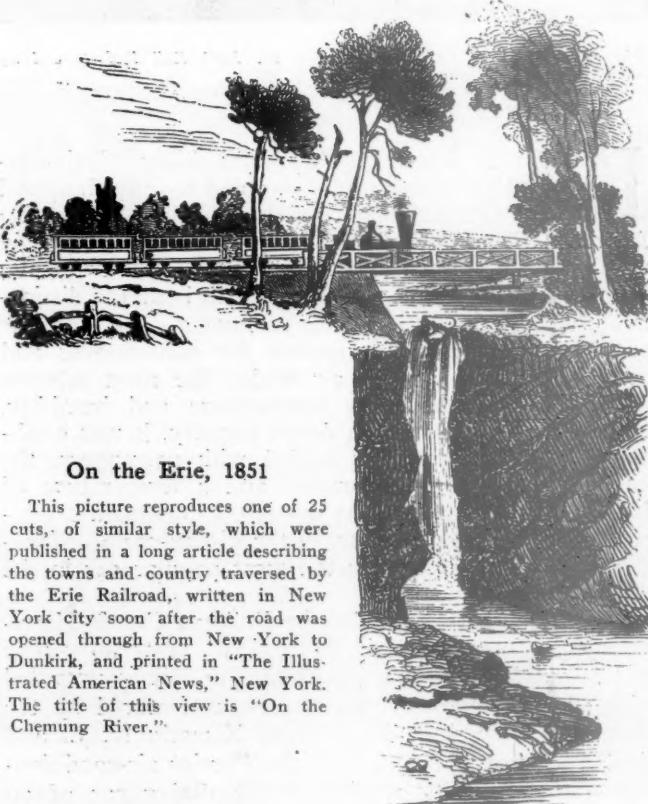
The commission's statement includes a table giving comparative figures for the years 1920 to 1929, which shows an increase during that period in the tonnage originated and the tonnage carried of products of agriculture, products of mines and of manufactures and miscellaneous, but decreases in animals and products, products of forests and l.c.l. freight. The latter classification shows an almost steady decrease in the tonnage of l.c.l. freight, which probably reflects the effect of truck competition, from 53,202,296 tons originated in 1920 to 36,043,271 in 1929, and from 89,901,495 tons carried in 1920 to 62,429,601 in 1929. The 1929 totals are less than those for any preceding year of the period.

The 1929 traffic as a whole shows increases as compared with 1928 of 4.71 per cent in the first quarter, 8.59 per cent in the second quarter, 7.96 per cent in the third quarter, and a decrease of 3.07 per cent in the fourth quarter.

The report gives the statistics of freight originated and terminated by tons and by carloads, with the freight revenue for each class of commodities, both by districts and by individual roads. The table showing the ten-year comparisons for the United States follows:

Products of agriculture	Originated	Carried
1920	110,839,554	220,049,724
1921	114,068,706	222,678,348
1922	111,787,032	220,660,207
1923	109,317,655	220,489,536
1924	116,586,794	230,851,877
1925	109,313,068	215,124,520
1926	111,787,387	223,923,885
1927	113,342,557	221,384,743
1928	118,021,911	225,550,147
1929	115,343,285	223,263,595

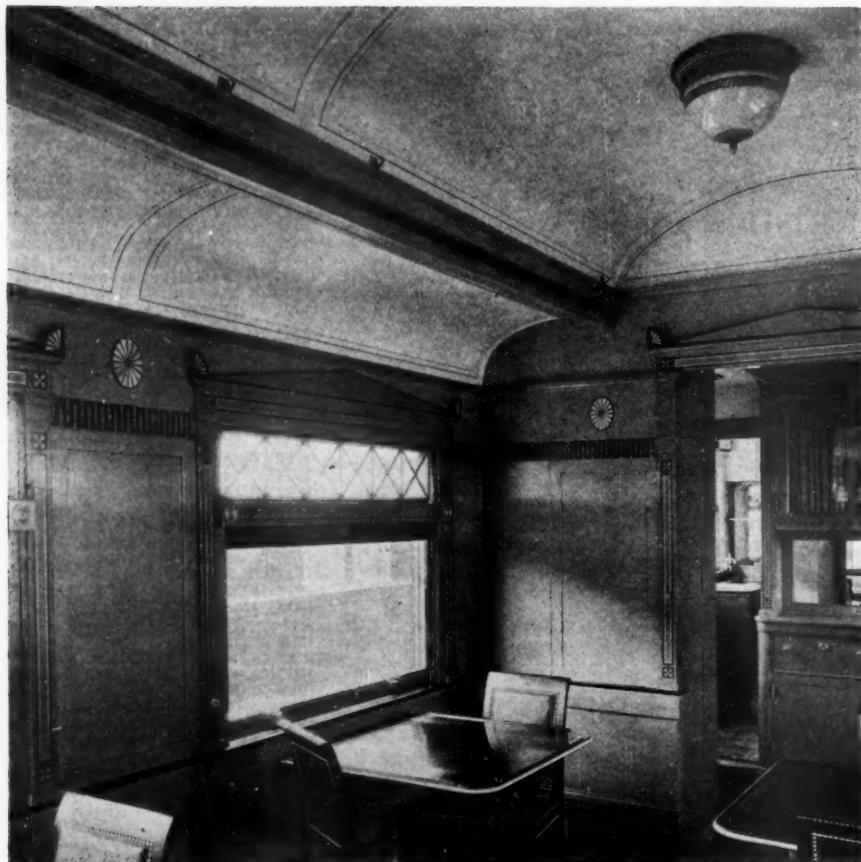
	Originated	Carried
Animals and products		
1920	26,594,856	44,853,503
1921	24,263,008	41,777,754
1922	26,230,230	44,838,913
1923	28,254,446	48,873,197
1924	27,747,010	48,521,368
1925	26,323,842	46,314,799
1926	26,243,489	47,022,643
1927	26,002,990	46,695,746
1928	25,683,848	45,723,698
1929	24,906,519	44,728,686
Products of mines		
1920	712,154,458	1,209,097,673
1921	511,270,449	878,224,638
1922	532,997,597	912,438,354
1923	713,734,824	1,250,245,258
1924	637,582,265	1,114,637,140
1925	678,336,071	1,212,013,894
1926	757,703,138	1,341,577,242
1927	713,401,947	1,272,303,868
1928	696,583,097	1,234,485,378
1929	737,878,712	1,296,810,803
Products of forests		
1920	100,765,537	195,579,878
1921	76,419,241	148,042,825
1922	89,059,248	171,239,150
1923	115,617,993	222,561,537
1924	108,094,065	209,359,687
1925	107,391,084	210,076,838
1926	104,850,837	204,790,308
1927	99,350,605	192,773,792
1928	96,736,937	187,347,241
1929	94,855,141	182,177,204
Manufactures and miscellaneous		
1920	251,864,290	494,556,078
1921	172,169,145	332,991,002
1922	220,441,687	421,829,412
1923	267,766,748	517,845,804
1924	256,736,587	500,275,846
1925	285,290,606	552,543,934
1926	296,066,483	579,829,682
1927	291,072,768	564,642,750
1928	312,013,252	605,255,923
1929	330,064,079	642,191,195
All L. C. L. freight		
1920	53,202,296	89,901,495
1921	41,992,011	67,048,130
1922	43,229,213	69,948,534
1923	44,338,556	73,585,432
1924	40,549,023	68,072,787
1925	40,586,944	68,200,761
1926	39,490,989	68,224,846
1927	38,440,319	65,838,043
1928	36,953,931	63,260,249
1929	36,043,271	62,429,601
Total		
1920	1,255,420,991	2,259,983,278
1921	940,182,560	1,690,762,695
1922	1,023,745,007	1,840,954,570
1923	1,279,030,222	2,333,600,764
1924	1,187,295,744	2,171,718,705
1925	1,247,241,615	2,304,274,746
1926	1,336,142,323	2,465,368,606
1927	1,281,611,186	2,363,638,942
1928	1,285,942,976	2,361,622,636
1929	1,339,091,007	2,451,601,084



On the Erie, 1851

This picture reproduces one of 25 cuts, of similar style, which were published in a long article describing the towns and country traversed by the Erie Railroad, written in New York city soon after the road was opened through from New York to Dunkirk, and printed in "The Illustrated American News," New York. The title of this view is "On the Chemung River."

Santa Fe Operates First Air-Cooled Car to Pacific Coast



The Diffusion Plate under Openings at the Deck Rail Defects and Spreads Cool Air as it Enters the Dining Room

IN order to determine the practicability of air-conditioned passenger equipment, and how much appeal this feature will have for the traveling public, the Atchison, Topeka & Santa Fe has recently placed in regular transcontinental service on its finest train, the *Chief*, a new diner, No. 1418, notable both for distinctive interior decoration and equipment, and for the provision of a complete system for conditioning and cooling the dining-room air under the most adverse conditions of outside air temperature and humidity. On the initial test runs in desert country, it was established that, with the car loaded with passengers, the kitchen stoves all in operation and a temperature of 104 deg. F. outside, it was possible to maintain a temperature of 72 deg., or less, in the dining-room. Needless to say, the diner was the most popular car in the train.

Diner No. 1418, built by the Pullman Car & Manufacturing Corporation, is 83 ft. long, seats 36 people and has a light weight of 209,000 lb. It is provided with an air-conditioning system, manufactured by the Carrier Engineering Corporation, Newark, N. J., and similar in general principle to the Carrier air-conditioning system recently applied in the dining car of an eastern carrier, as described in the *Railway Age* issue

New diner, completely equipped for controlling temperature and humidity, is placed in regular trans-continental service on the "Chief"

of August 9, but differing from it principally in that 32-volt electric power is used throughout, storage batteries are provided to carry the load while stopped or during slow-speed operation, important changes have been made in location of detail parts, and a different method is used for introducing conditioned air into the dining-room.

Power for the air-conditioning system on the Santa Fe diner, as well as the lighting load, is taken from two Safety 7½-kw., 32-volt generators, with Foote direct-drive from the inside car axles. Three 750-amp.-hr. Exide Ironclad batteries, with a total capacity of 2,250 amp. hr., are connected in parallel across the line to provide reserve power for the cooling and lighting load at stations and at speeds below approximately 15 miles an hour when the generators cut in. The battery acts as a flywheel on the power system when the air-conditioning motor load goes on or off, and provides sufficient reserve capacity to keep the light and the air-conditioning system in operation for six to eight hours, unaided by the generators.

Not only is it necessary on the Santa Fe to provide for air conditioning while the train is operating on long



Safety 7½-Kw. Generator with Direct Mechanical Drive from the Car Axle

grades and at speeds necessarily less than required to enable the generators to carry the full load, but due precautions must be taken to guard against damage to the equipment under widely varying and extreme temperature conditions. For example, air conditioning may be required in service on the desert one day, and freezing temperatures be encountered the next, in the mountains or on the eastern end of the line. Consequently, the system is designed with the condenser and evaporator tanks on the roof, all water draining back into the inside of the car upon shut-down of the system. A special anti-freezing mixture, known as Carrene, is circulated through the water jackets of the refrigeration compressor for cooling purposes, owing to the unavoidable location of this unit in an exposed position underneath the car. Automatic louvers, admitting air to a water-cooling tower, can be closed in winter.

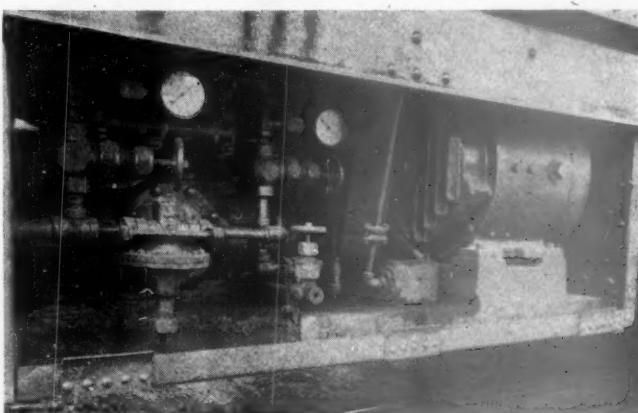
The air-conditioning system is installed without any sacrifice of interior beauty. In fact, the upper deck is entirely free of deck sash and ventilators, and presents a neat and pleasing appearance. Electric fans, always more or less of a problem to locate satisfactorily in dining cars, are omitted entirely. The tapered sheet-metal air ducts, designed to give a uniform distribution of air throughout the length of the dining-room, are located between the ceiling and the upper deck or roof, being provided with 23 long, rectangular outlets at the deck rail on either side of the car. A long diffusion plate, about 5 in. wide, and located just under each row of deck-rail openings, assists further in distributing the conditioned air uniformly throughout the dining-room, without in any way detracting from the harmony of the interior design. The cooling and air-conditioning system is installed with the loss of only a single locker, in one end of the car, utilized for the water-cooling tower. No additional insulation is used in the side walls of the car. The air ducts for the cooling system, however, are heavily insulated with 2-in. cork.

The control of the air-conditioning system is notable for its simplicity. Pressing a single contact point puts the entire unit in operation by means of automatic

switches and relays. The only other control necessary is the movement of two out-door air dampers operated by a single handle over the pantry door in the buffet lobby. The adjustment of this handle and of the dampers, depends upon the number of passengers in the dining-room.

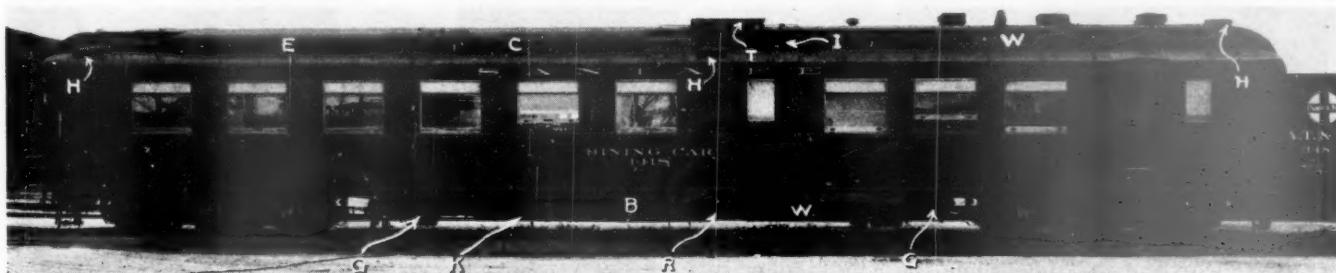
How the Air-Conditioning System Works

The foundation of air conditioning on the Santa Fe diner is a compression refrigerating system, by means of which the compressed refrigerant passes through a



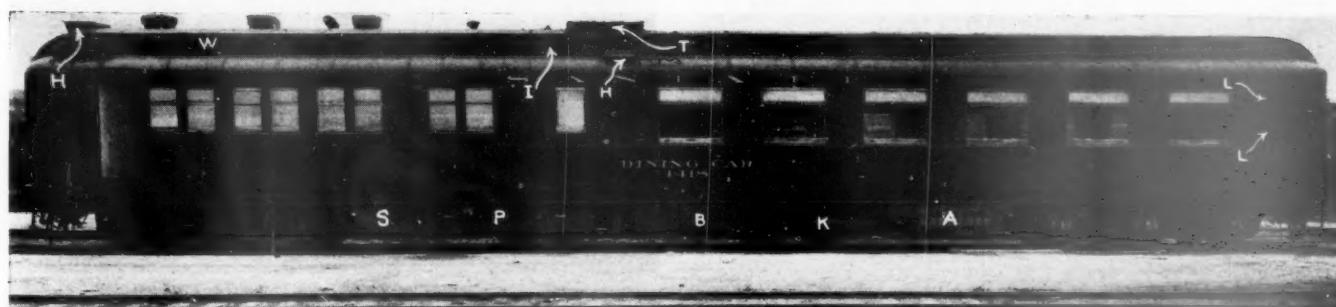
Refrigeration Unit Driven by a 7 1/2-Hp. Electric Motor

condenser tank where it is cooled and liquified, then expanding through a special valve to an evaporator tank, in which it absorbs heat from water circulated through an air-cooling unit. The return of the refrigerant under relatively low pressure, to the compressor, completes the cycle. An automatically-operated discharge valve in the suction line to the compressor intake governs the degree of refrigeration secured. Water, circulated through pipes in the condenser tank for cooling purposes, is itself cooled in a spray-type cooling tower in one corner of the car.

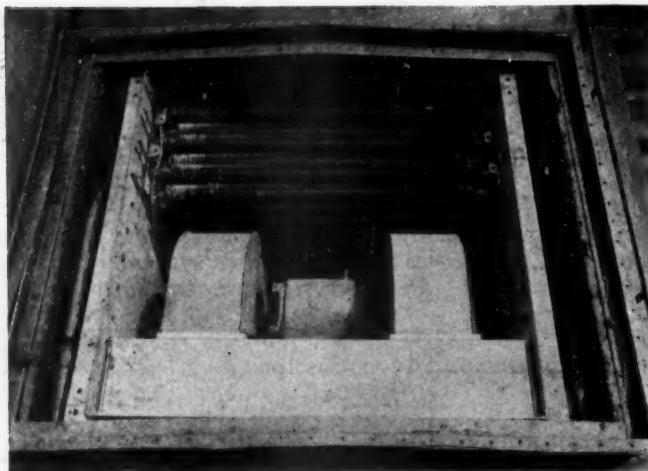


A—Motor-driven refrigeration unit
B—Electric storage-battery box
C—Refrigerant condenser tank
D—Refrigerant evaporator tank
E—Generator with direct drive from axle
F—Hatch for icing refrigerator from roof
G—Air intake with manually operated shutter

H—Part of the air-brake equipment
I—Louvers to cooling tower
J—Iced provision box
K—Water system pump
L—Box for kitchen coal
M—Trap door to blowers
N—Kitchen deck sash, roof ventilators and smoke jack



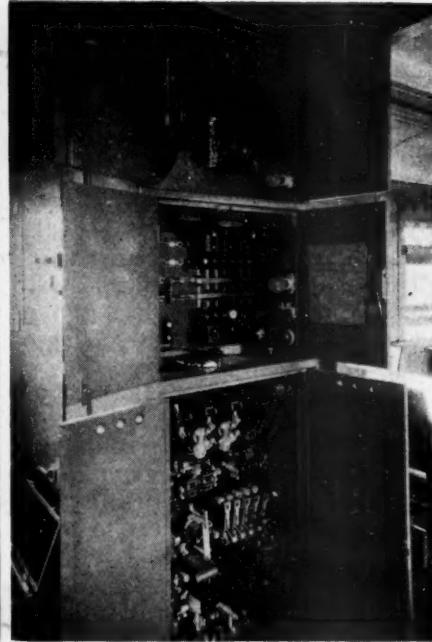
Side Views Showing Location of the Air-Conditioning Equipment on the Santa Fe Diner



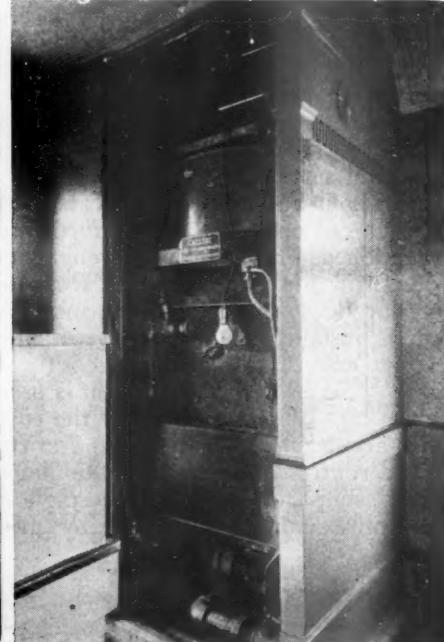
Motor-Driven Blowers and Aerofin Coil Unit
Used in Cooling the Air



Re-circulated Air Intake
in Buffet Ceiling



Electric-Control Panels
Compactly Arranged



Water-Cooling Tower Located
in Corner Locker

In order to assure freedom from dirt, dust, cinders and outside gas, the doors and windows of the diner are kept closed all the time while the conditioning system is in operation. Out-door air is taken into the car through mechanical air filters, located in the upper deck of the buffet section at the center of the car. This air then passes over Aerofin cooling coils, which reduce the temperature to the desired amount and condense any excess humidity. Motor-driven fans circulate this conditioned air through the insulated ducts and distribute it to the interior of the car, as mentioned.

Air from the dining-room re-enters the cooling system at a grating in the ceiling of the buffet section, where it is again mixed with the right amount of outside air and passes through the duct system. When the temperature of the dining compartment reaches a predetermined point, usually set at 10 or 15 deg. below the outside temperature, a temperature regulator and mechanical interlock closes the louvers, or moving vanes at the intake, permitting the re-circulation of air within the car without passing over the cooling coils. As the

car temperature rises, the reverse operation takes place and automatic temperature regulation is provided. The amount of out-door air required is governed by the number of passengers in the dining compartment, being controlled by manually-operated shutters on each side of the middle deck of the car.

Referring to the two side views of the Santa Fe diner, the principal parts of the air-cooling and conditioning system, in addition to the generators *GG* and batteries *BB*, already mentioned, include a refrigeration compressor, driven by a $7\frac{1}{2}$ -hp. electric motor, and located in the compressor box *A*; refrigerant condenser tank and evaporator tank, located at *C* and *E* on the car roof; motor-driven blower and air-cooling coils located in the roof of the car under the trap door *T*; an air intake *I* on each side of the car, with manually operated shutter to admit outside air through steel-wool filters to the cooling unit and two double-inlet blowers; spray-type cooling tower, with louvers *LL*, located in a locker in



Part of the 2,250-Amp.-Hr. Exide Ironclad
Storage Battery

one corner of the car and designed to cool the condenser water, as well as the Carrrene used in the compressor water jackets. Additional equipment includes a .6 hp. motor for operating the spray in the cooling tower; a 1.5-hp. motor-driven pump for circulating the compressor cooling fluid; a .95-hp. motor-driven pump for circulating water in the air-cooling system; thermo control through the back-pressure valve to prevent the temperature in the evaporator tank getting down to the freezing point; safety switch to prevent excess pressure in the condenser tank by opening a relay in the electric circuit to the compressor motor; Cutler-Hammer electric control panel and equipment.

The refrigerant system is closed and does not normally require replenishment, except at infrequent intervals. The cooling-water system to the Aerofin cooling unit also is closed and does not lose water, but condensation of moisture in the air passing through the unit produces more or less water which is disposed of through a waste pipe. This is the method of removing moisture from the incoming air and controlling the humidity. The water in the cooling tower is sprayed by a motor-driven pump and cooled as it passes downward through air taken in through the louvers from the outside of the car. More or less condenser water is evaporated by this process and, under extreme conditions, make-up water to the amount of about 12 gallons an hour may be required, supplied from a tank in the top of the car and through an automatic float control valve in the cooling tower.

Electrical Details

The Safety 7½-kw., 32-volt electric generators are connected in parallel and governed by constant-potential regulators adjusted to 37 volts. These generators, with the gear reduction at present included in the Foote direct drive from the inside car axle on each truck, begin to relieve the batteries of load at about 15 miles an hour and carry full load at 20 to 25 miles an hour. The three 750-amp.-hr. Exide Ironclad storage batteries are connected in parallel across the line, the batteries being conveniently located in the usual manner, as illustrated, in battery boxes under the car. The Cutler-Hammer control panel and equipment provide practically automatic and fool-proof operation of the electrical equipment. The air-conditioning system can be started by pressing a single button. All motors are protected by overload relays and low-voltage relays. In wiring the car sufficient copper was used to avoid excessive voltage drop. The entire design of the car from a mechanical as well as an electrical standpoint was developed with a view to securing a high factor of safety and maximum reliability of operation.

THE AUSTRIAN FEDERAL RAILWAYS, according to Modern Transport (London), have decided to make a change in the signal colors used on their lines. Heretofore, a clear signal has been indicated by a white light, while green has been used for "caution." In view of the disadvantages of a white light for signaling purposes, the new system will employ the three standard colors, green, orange and red, to indicate "clear," "caution" and "stop," respectively.

THE DRUMM ELECTRIC BATTERY, the invention of Dr. James Drumm, an Irish scientist, designed for use in railway and other heavy transport, has been undergoing a series of tests on the Great Southern Railways of Ireland, according to Modern Transport (London). It is said that maximum speeds of 50 to 60 miles an hour may be obtained, while it is hoped that if the battery proves successful the Irish railways may be at least partially electrified at a relatively low cost.

Pennsylvania Scores New Low Inventory Record

THE Pennsylvania established a new inventory record for the property in June, 1930, when it closed the month with a value of unapplied materials and supplies of all kinds amounting to \$38,790,644. This was a reduction of approximately \$5,370,000 from the high point of the last six months and a reduction in the neighborhood of \$3,000,000 from the value of stocks at the end of 1929 when, as reported in the *Railway Age* of June 14, this road had already effected a reduction of \$1,200,000 from the corresponding annual inventory figure for the previous year. The June inventory also represents a reduction of \$6,200,000 from the value of stock on hand on June 30, 1929, and reflects a total reduction in the values of unapplied materials of approximately \$80,000,000 during the last ten years.

The value given of materials on hand, which is the value used in the supply contract work on the Pennsyl-

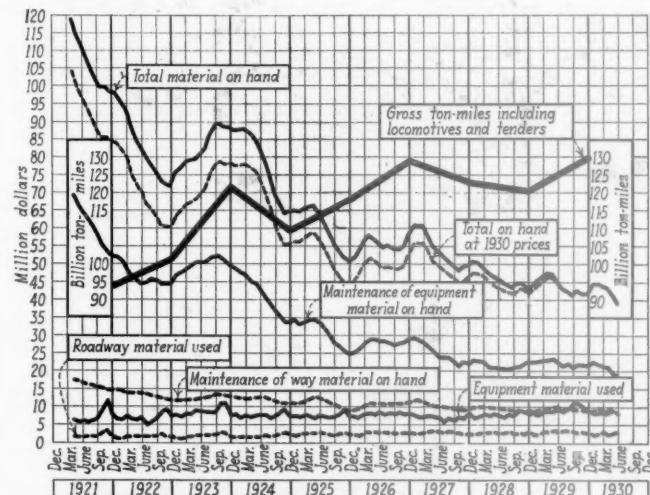


Chart Showing Amounts of Material Used and on Hand Since 1921

vania, include materials received but not paid for and are therefore larger than the inventory values reported to the Interstate Commerce Commission as the book value of Account 716, which includes only materials for which bills have been passed. For the years 1928, 1929 and 1930, reclaimed and repaired maintenance of equipment materials are included in the figures at the price of new material.

Cut Inventories More Than Half

As a result of these reductions, the Pennsylvania is operating on less than half the value of stock required in the peak year of 1921, although the business of the railroad, as reflected by gross ton-miles of freight hauled, has greatly increased.

The progress of the Pennsylvania in stores control is brought out by the charts. One of these shows the value of all material on hand (including materials received but not paid for) at the end of each month since April, 1921, when the Pennsylvania had stocks on hand valued at \$119,771,000 at the price levels then in effect. It will be seen that the trend has been sharply and almost uniformly downward, with the inventories at the

end of each year, in all but two years, showing successive reductions. The downward trend would not be as sharp if the inventories in the earlier years had been all valued at present market prices, as will be noted from the additional curve prepared to show the "On Hand" value of each month from April, 1921, to June, 1930, based on average prices during 1929. This curve shows that, of the total reduction of \$81,000,000 from April, 1921, to June, 1930, approximately \$15,000,000, or 19 per cent, represents the shrinkage in the prices, leaving \$66,000,000, or 81 per cent, as the approximate reduction on the basis of the prices prevailing in 1930.

The gross ton-miles of freight hauled, although far from being an exact measure of supply conditions, invite attention not only by indicating the trend of revenues with which supplies are purchased, but also by indicating the extent to which materials are needed for repairs and improvements. While the value of unapplied stocks has steadily decreased, the charts also show an almost steady increase in the gross ton-miles which rose from 93,000,000,000 gross ton-miles for the year 1921, to 130,000,000,000 gross ton-miles in 1929, a total increase of 40,000,000,000 gross ton-miles in the nine-year period, or about 40 per cent. The average monthly balance of total supplies on hand on the Penn-

sylvania has been steadily increased to an average of 3.4 times during 1929 from 1.4 times in 1921. In all cases, the value of material consumed, from which the turnover figures were developed, represented only material charged to closed accounts and does not reflect the movement of material merely transferred from one point to another, nor the value of raw materials which are consumed in the manufacture of finished articles.

At a time like the present when railroad traffic is below that of previous years, and when the general feeling is that business has slowed up beyond what the conditions warrant, it is significant to note the continuity in the consumption curves (materials used) from month to month during the last 10 years, and particularly during the last 6 months. In this respect the Pennsylvania's record is typical of railroad material consumption, which, though usually falling off in dull times, normally continues at a substantial rate throughout each year.

Budgeting Aids Control

Since the first of the year, the total inventories are shown by the charts to have increased substantially before the low point in June, 1930, was reached. While the trend of the last 10 years shows this to be, in part, a seasonal condition, resulting partly from the large receipts of rail and ties in the early portions of the years, the charts show the effect of the business depression. It will be seen from the curve of equipment material on hand that the volume of unapplied materials began to increase with the curtailment of consumption in October, 1929, and the same situation is true of roadway material.

The curves also show that the sharp change in the rate of consumption was quickly discovered, and a reduction in the inventories by June, 1930, to the lowest point recorded is considered a gratifying performance in stock control by the Pennsylvania. It is attributed to its special type of inventory control, comprising, as described in detail in the *Railway Age* of January 21, 1928, a system of master stock books in the central office for checking all orders for material against surplus stocks available, a supplementary budget system under which an allotment, based upon the operating department's expense budgets, is fixed each month for each class of material purchased and an effort made to keep the value of the purchases during the month from exceeding that allotment.

As to the value of that system in carrying the Pennsylvania's stores management through the present business conditions, and its effect in keeping the lessened consumption from increasing inventories unduly, the opinion on the Pennsylvania is that the plan of budgeting purchases of maintenance materials has had a substantial bearing in facilitating the control of materials on hand since the first of this year. This plan is applied to maintenance material and does not include the value of materials required for road and equipment capital projects.

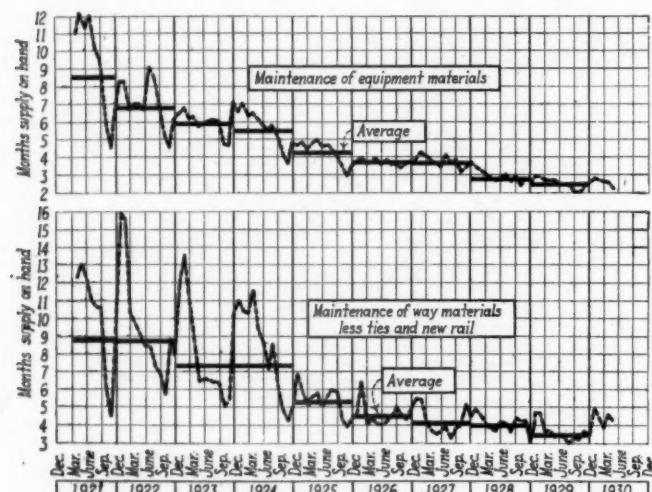


Chart Showing Average Turnover and Trends

sylvania during 1929 represents 33 cents of material per 1,000 gross ton-miles, as compared with the value of \$1.18 per 1,000 gross ton-miles during 1921, or a decrease of approximately 85 cents per 1,000 gross ton-miles, including the adjustment for the difference in market prices.

Turnover Decreased

The charts show also that the stocks of materials for maintenance of equipment, including materials received but not paid for, were reduced from the value of approximately \$70,000,000 in 1921, to \$20,000,000 in 1929. This took place in the face of an increase in the amount of material used, and reflects a substantial increase in the rate at which stock was turned over each month. The June, 1930, inventory represents a 2.3 months' supply on hand, based on the June consumption, as compared with a 12.0 months' supply on hand at the peak month of 1921.

The charts show that the stock of material on hand for maintenance of way, including materials received but not paid for, and excluding ties and new rail, did not change as much, and this is also true of the consumption of these materials, but the rate of turnover

THE POPULATION OF CANADA is now nearly ten millions. The Government Bureau of Statistics estimates that on June 1, last, the total was 9,934,500; this is an increase of 137,700 over 1929. The Bureau gives the following figures as the estimated population of each province and territory: Prince Edward Island, 85,800; Nova Scotia, 553,900; New Brunswick, 423,400; Quebec, 2,734,600; Ontario, 3,313,000; Manitoba, 671,500; Saskatchewan, 882,000; Alberta, 660,000; British Columbia, 597,000; Yukon, 3,700; and the North West Territories, 9,600.

Railways and Shippers Oppose Howell Bill

Fundamental objections voiced by both—N. I. T. L. proposes substitute for section 15a

ARGUMENTS in opposition to the provisions of the Howell bill, S. 4005, to change the basis of railroad valuation for rate-making purposes by substituting a "rate base" plan, have been submitted to Chairman Couzens of the Senate committee on interstate commerce by Alfred P. Thom, general counsel of the Association of Railway Executives, and R. C. Fulbright, chairman of the legislative committee of the National Industrial Traffic League, in response to requests of the committee for written statements on the bill. Both also asked that public hearings be held on the bill when Congress reassembles to give an opportunity for more detailed consideration of it, and Mr. Thom's letter refers to a statement by Senator Couzens indicating a belief that the committee will desire full hearings.

Mr. Thom not only objects to the proposal to establish a rate base avowedly less than the true value of the property because of its tendency to reduce rates but says that if the policy of recapture is to be continued, there is no escape from the necessity of ascertaining true value, and he asserts that Congress can not validly define the weight to be given to the several elements which must be considered in ascertaining value.

"Is it in the public interest," he asked, "to make investment in railroad properties less attractive, and thus and otherwise endanger an adequate system of rail transportation, by the requirements contained in this bill that railroad charges are to be limited by rate bases materially below actual values; by the initiation which it makes of an insidious and dangerous approach to government ownership and management; by the attempt to deprive the carriers, as the bill does, of recognized constitutional protection; and by other restrictive features which it contains?"

Mr. Fulbright expresses on behalf of the league not only opposition to the bill but to "the whole bundle of fallacies which were handed to the public in section 15a," and in addition he has submitted a proposed bill to revise section 15a by substantially changing the provisions with respect to the basis for adjusting freight rates and by repealing the recapture clause. The communication, he says, is intended as an expression of views on behalf of the league as a whole, at the request of its executive committee, but with the reserved right of any members to express a contrary or additional view as to any point involved in the bill. The committee is also asked to grant public hearings on the proposed law and any other bills which may be pending involving the same subject matter.

The views expressed to the committee by the National Association of Owners of Railroad and Public Utility Securities were reported in last week's issue. The American Electric Railway Association has also filed a statement.

Much of Mr. Thom's statement is in the form of comment on the Interstate Commerce Commission's reports to the Senate committee on the Howell bill and a

WASHINGTON, D. C.

joint resolution, S.J. Res. 104, from which it developed. Extracts from his statement follow:

S. J. Res. 104

S. J. Res. 104 marks the first step in the development of the Howell bill (S. 4005) now before the interstate commerce committee of the Senate. The opinion of the commission (as to S. J. Res. 104) was given in a letter to the chairman, dated January 20, 1930, one commissioner dissenting. Inasmuch as this letter exercised a profound influence on the evolution and development of the Howell resolution into the Howell bill, it merits careful consideration and somewhat extended analysis and comment.

The emphasis of the commission is on the power of Congress to direct the establishment of an artificially determined aggregate rate base, which may, in their view, be ascertained without considering the elements held by the Supreme Court as necessary to be considered in ascertaining value, and on the use of such aggregate rate base in the making of rates. It is interesting to note that, since the commission's letter was written, the Supreme Court of the United States has stated in express terms that "it is the settled rule of this Court that the rate base is present value" (United Railways v. West, 280 U. S. 254), and thus again announces a constitutional principle completely destructive of the commission's proposal to make a rate base different from present value.

It may well be doubted whether the considerations suggested by the commission, that some carriers might not be able, under the suggested statutory rule, to show confiscation, while others might, and that those who could show confiscation might not be able, for practical reasons of competition, to avail themselves of their constitutional rights, are sufficient to justify Congress in abandoning the basis of value and in adopting a rule, even for rate-making purposes, admittedly resulting in a rate base different from and presumably less than the true value of the properties devoted to the public use.

Mandate of Present Law Not Yet Complied With

There is, however, a wide difference of opinion among students of the question as to whether rates are in reality made on any rate base, regardless of the question whether or not such rate base correctly expresses value. Many think that rates, instead of being ascertained by reference to values of property or rate bases, are the product of commercial and economic conditions. They perhaps feel strengthened in this view by the undisputed fact that for ten years there has been an express statutory mandate by Congress that rates shall be so fixed as to produce, as near as may be, revenues which will constitute a definite percentage on a rate base made up of the aggregate of the true values of the carrier properties in a group, and yet this statutory mandate has never been complied with by the commission.

It is not to be assumed, the holders of this view assert, that a tribunal so able and conscientious as the commission would have failed, during this extended period of years, to obey the mandate of Congress if they had found it practicable to do so.

But, even if, as the commission thinks, carriers find it difficult, for reasons of competition, to assert their constitutional rights to higher rates, their rights to resist the reduction of a schedule of rates already sufficiently low must not be overlooked; and values of properties in a group, when properly ascertained, afford a legitimate, a substantial and an entirely proper defense against efforts to reduce rates necessary to a fair return on the value of the property and which accordingly should not be reduced.

Aside, however, from the question of rates and rate-making, and admitting that the carriers as to whom an existing body of rates may be unconstitutionally low may find it difficult, because of competitive conditions, to avail themselves of their

constitutional rights to have them increased, and that consequently little is heard in the courts of complaints by the carriers against rates, there still remains the very serious and entirely practical question of the recapture of earnings.

Recapture Requires Ascertainment of Value

The ascertainment of the amount of earnings which may be recaptured undeniably involves the ascertainment of value, and cannot be determined by an artificially constructed rate base which is different from value.

It is submitted that no one properly can condemn a rate base made up of true values, as is now required by section 15a, on the ground that the rate base so constituted would be in any way unjust or unduly high. Nor can any one justly contend that rates, *if made on a rate base lower than the aggregate of the true values of the properties devoted to the public use*, are not affected by the lower rate base and consequently lower than they would be on a rate base made up of true values.

The true value rate base, under proper rates, would accordingly give to certain carriers in a group larger revenues than they would receive on the smaller rate base, even before they reached the recapture class. To deprive them of these additional and legitimate revenues through the device of an artificially created rate base would be to deprive them of a substantial constitutional right, however, difficult it might be to enforce.

The constitutional right of all carriers—both those favorably and those unfavorably situated—is to have no part of their earnings taken away, except what the law permits to be taken and designates as the excess over a fair return upon the true values of their properties devoted to the public use. So long as it is the policy of Congress to authorize the recapture of what are termed excess earnings, it will be necessary that true value be known, as value is the essential basis of recapture, and this ascertainment cannot be avoided by the device of an artificially made rate base or otherwise. No legislation undertaking to eliminate value as the basis of recapture would be constitutionally valid.

Nor could Congress, as the commission suggests, validly define the weight to be given to the several elements which must be considered in ascertaining value. As stated by the commission itself, these elements must be given such weight, and only such weight, "as may be just and right in each case." What that weight is, is a judicial, not a legislative, question. Moreover, the proposal is clearly objectionable to define by statute, and thus make constant, that which in its nature and essence is and must be variable.

The commission, in its letter of January 20, 1930, takes the further position that, in considering the extent to which the power of regulation possessed by Congress is circumscribed by constitutional limitations, a differentiation should be made between the future and the past. It entertains little doubt that Congress has practically a free hand in fixing the conditions under which future investment shall be made in interstate railroad properties, giving the reason that, in its opinion, whatever conditions are fixed by Congress, investments would be made in the light of and subject to such conditions.

Our understanding of the commission's position is that it goes so far as to declare that the principle thus announced would be applicable to investments hereafter made to enlarge, perfect or maintain *existing railroad properties*, even though the work was compelled by national or state authorities (for example, elimination of grade crossings, adoption of safety devices, provision of more adequate facilities)—in other words, that it is within the constitutional power of Congress to enact a law providing that an existing railroad company engaged in interstate commerce could not borrow money to enlarge, perfect or even to maintain its plant, no matter how great and compelling the necessity, unless, as to the money so borrowed and the property in which it is invested, it and the investors in its securities would agree to surrender all right to constitutional protection.

Without now pausing to discuss at length what Congress might do as to investments hereafter made to construct a railroad for a new company to be hereafter organized to engage in interstate commerce, it should be observed in passing, even in that aspect of the question, that the possession of a power in Congress to strip arbitrarily all enterprises hereafter organized to do interstate commerce, however essential to the public welfare, of all constitutional protection, would be tantamount to an arbitrary power to prevent the establishment of facilities for interstate commerce although essential to the public welfare, and should not be considered as legitimately following within the constitutional power to regulate interstate commerce.

After giving the arguments, most strikingly and intelligently presented, in favor, from its point of view, of abandoning

value as defined by the Supreme Court as a basis for rate making, and substituting in its place a rate base different from such value, the commission suggests a method of arriving at a rate base, not only different from such value but different from the principles applied by it in the O'Fallon case. The modified method which the commission then suggested is as follows:

Take the cost of reproduction new at the 1914 unit prices of the property existing at the original valuation date, plus the then value of the land, adding or subtracting the subsequent net increase or decrease in the property investment account as shown by the accounts when correctly kept, adding further a proper allowance for working capital and deducting the balance standing in the depreciation reserve.

The result would be the rate base proposed by the commission, and the commission states that it would be glad, if it is desired, to aid in the preparation of legislation and supporting committee reports to carry this view into effect.

S. J. Res. 104, supplemented and developed by this letter of the commission dated January 20, 1930, is evidently the genesis and explanation of the Howell bill (S. 4005) introduced in the Senate on the calendar day of March 22, 1930. This bill we will now proceed to discuss.

The Howell Bill, S. 4005

Aside from the legal and constitutional objections to the bill, it is deemed proper at the outset to emphasize the strong economic and social considerations against the restrictive policy which this bill proposes. It is essential to the public that the systems of transportation on which it must depend shall be strong and capable of performing adequate and efficient service. No community can prosper on weak and inadequate transportation facilities. The small cost of an essential service cannot make up for the lack of it. Low rates cannot compensate for poor transportation. There is no danger to the public from strong and prosperous railroads. Even if they had the purpose to oppress, they are already so regulated as to make oppression impossible.

Bearing in mind the important relationship of the rail carriers to the social and economic welfare of the people, it is well to consider deliberately whether it is wise public policy for Congress, at public expense, to foster and develop transportation by the waterways and the highways, the effect of which will inevitably be to diminish the traffic available for the support of the rail carriers, and at the same time adopt a scheme of legislation the effect of which will be to hamper, restrict and injure the railroads.

The Howell bill, on April 3, 1930, soon after its introduction, was likewise referred, by the chairman of this committee to the commission. The commission replied in a letter received by the chairman on May 17, 1930, giving its views at length on the proposal, with one commissioner dissenting.

Objections to the Bill

Objections, which seem to us controlling, have hereinbefore been stated, to the establishment of a rate base arrived at by the rejection of all requirements as to value laid down by the Supreme Court of the United States, and to its use either for rate making or for recapture purposes. These objectionable features, together with others which are likewise objectionable, appear in the Howell bill.

Under its terms, the properties of the carriers are divided into two classes, and a different method is prescribed for arriving at the respective rate bases for each of these classes. One class includes all carriers whose properties were inventoried by the commission under section 19a of the Act prior to January 1, 1922. The other class includes all carriers whose properties were not so inventoried prior to January 1, 1922. The second class here enumerated embraces only "new carriers" which constructed lines and began operation subsequent to January 1, 1922; and these, as appears from the commission's letter, were inventoried after some date in 1927.

Method of Determining Rate Base

The other class, namely, those inventoried prior to January 1, 1922, embraces practically all the important railroads of the country, and, as to this class, the bill provides that the rate base of each of them shall be determined by adding:

- (a) The cost of reproduction new of the properties, other than land (including property of another carrier or carriers used in its entirety, or in its entirety except for individual parcels, by the operating carrier), inventoried at the 1914 unit prices.
- (b) The value of the land on the original valuation date;
- (c) A reasonable and proper allowance for working capital; and adding or deducting, as may be appropriate;
- (d) The amount of the net increase or decrease, between the date of said original valuation and the given date—on account of changes in the carrier's properties—which the commission finds was or should have been recorded, in accordance with its requirements, in the property investment account of the carrier on account of road, equipment and general ex-

penditures (not including any amount from the "public investment account" provided for in the bill); and deducting

(e) The amount which the commission finds was or should have been included at the given date, in accordance with its requirements, in the depreciation reserve of such carrier on account of road, equipment and general expenditures (but not on account of any property represented by said "public investment account").

In separating the carriers into these two classes, the bill creates a difference between the carriers as to the respective proposed rate bases which, it is respectfully submitted, cannot be justified.

Moreover, in allowing certain carriers a rate base arrived at by considering present-day prices, which is in effect done as to those inventoried after 1926, and arriving at the rate base for all others not at present-day prices, but at the much lower prices of 1914, there is created an obvious and indefensible discrimination.

A Rate Base Less Than Value

Avowedly, therefore, the statutory rate base is not intended to express value. As it is to be arrived at by omitting all consideration of substantial elements of value, such as current costs, which the Supreme Court indicates must influence the resulting conclusion, it is fair to conclude that the proposed rate base is likely, and is intended, to be less than the real values of the properties ascertained in accordance with law.

Having arrived at a rate base by the process above outlined, that rate base, or the aggregate of the rate bases in a group, is made the measure and standard of what constitutes a "fair return," the bill expressly providing that in making rates they must be so adjusted that the carriers in a group may "earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate of their contemporaneous rate bases"—not upon the aggregate values of their properties devoted to the public use. While it is undoubtedly true that the level of rates, if fixed in reference to a rate base, depends, under the scheme of the bill, not only on the rate bases, but on a combination of the rate basis and the percentage which the commission shall from time to time prescribe, still, if value is not to be ascertained, it will not be known how much the rate base falls below value and it will be a difficult, if not impossible, task to make up that unknown difference by a compensatory percentage.

It is far more likely that the habit will grow of considering the rate base and value as interchangeable, and there will doubtless be a strong tendency to regard, and for the public mind to accept, the rate base as a true expression of value, although inadequate for the purpose and arrived at in defiance of the principles laid down by the Supreme Court for ascertaining value. In fact, the bill now under discussion and the commission's recommendation in effect do that, as they make the rate base not only a part of the mechanism of rate-making but use it as the measure of fair return and as the measure by which recapturable amounts are to be ascertained. If this should happen, as it has already happened in the bill and in the commission's recommendation, then the level of rates would be lower than if based on value, and there would inevitably be carriers in a group not subject to recapture, whose revenues would be unlawfully depressed by this device of rate making.

A Defiance of the Court and of the Constitution

But, as the above indicated, it is not proposed to stop at this point with the use of the proposed rate base as a standard. The proposals of the bill go far beyond the use of the rate base for rate making purposes, and use it as a measure for determining a fair return and the amount of the earnings of the individual carriers subject to recapture.

There is, and there can be, no valid contention that 6 per cent on the true value of a carrier's property is in excess of a fair return. Brought down to this last and final test of recapture, the bill undertakes to require the commission to proceed in determining and collecting the recapturable amounts in direct opposition to the rules laid down by the Supreme Court in the O'Fallon case, which was a case of recapture in which the commission had proceeded in substantial compliance with the principles of the Howell bill and in which these principles had been condemned and rejected by the court.

It is respectfully submitted that Congress will not accept and endorse so flagrant a defiance of the court and of the constitution.

Proposals as to Recapture

The proposals of the bill, as to recapture, are that, beginning January 1, 1930, all of the annual net railway operating income of an operating carrier in excess of 6 per cent of the average of its rate base for a given period of two years, as in the

bill defined, shall be treated as excess income to be held in trust, one-half for the United States and the other half for the investors.

In respect to the one-half to be held in trust for investors, the bill provides that it shall be placed in a reserve fund for the purpose of paying dividends or interest on stocks, bonds, or other securities, or rent for leased roads; that it may be drawn upon by the carrier to the extent that its net railway operating income (presumably in any year) falls below 6 per cent of the rate base; that it shall not be accumulated and maintained beyond a sum equal to 5 per cent of the carrier's rate base, and that when it is so accumulated, and so long as it is maintained, the remainder of said excess income held in trust for investors shall be used in liquidating the carrier's fixed obligations, either in conformity with the terms thereof or by the purchase of its securities in the open market.

Gradual Government Ownership

First, as to the one-half to be held in trust for the United States. As to it, provision is made, not for its being loaned to a carrier, but for its expenditure, with the approval of the commission, in providing extensions of lines or other additions or betterments to the carrier's railroad property, the "public investment" so made to be represented by certificates of the trustee and held by the commission, the intention and effect being, as we assume, to make the United States the beneficial owner of the railroad property provided by this investment of funds held in trust for the government.

The gravity of such a consequence cannot be overstated. Under the subtle process of its workings, the government would be gradually acquiring a proprietary interest in the railroad property. Its results have been worked out statistically in a given case, showing that in 32 years the government would be the beneficial owner of over 49 per cent of that railroad. Moreover, the provisions in the Howell bill for using part of the recaptured funds for the liquidation of securities, if carried into effect, would be progressively to eliminate liens upon the property and, therefore, to increase the relative importance of the government's growing equity produced by the investment of the one-half of the recaptured funds held in trust for it, and thus make a distinct advance and increase of the government's proprietary interest in the railroad property.

Such a consequence of the two provisions referred to cannot be viewed with equanimity by those who do not favor government ownership.

If provisions as to recapture are to be retained in the law, as to the wisdom of which the commission expresses grave doubt, the commission proposes an alternative to the provision of the Howell bill, which alternative is set out in a detailed draft attached to their letter of May 17, 1930. In our opinion, if provisions as to recapture are to be retained as a part of governmental policy, the alternative proposals, made by the commission are vastly superior to the provisions in respect to recapture contained in the Howell bill.

The Commission's Recapture Proposals

Speaking generally, the commission retains the provisions of the present law as applied to that one-half of the recaptured funds which is held as a reserve by the carrier. . . . As to the government half of the recaptured funds, the commission withheld its approval of the proposals in the Howell bill and likewise points out objections to the provisions of the present law. It does, however, approve of the general purposes set out in the present law, in respect to the use of the fund for the purpose of improving transportation, but thinks that there are certain limitations in the existing statute which make it unworkable. It accordingly proposes to liberalize its provisions so as to enable the commission to use the fund for what it considers practical and useful purposes. It proposes to do this by broadening its power over the fund to enable it to use it either for loans to needy carriers or for the purchase of equipment or facilities of transportation for lease in such way as will promote the public interest in adequate transportation service.

It will be observed that the commission's plan, as here indicated, avoids, as to the government half of the recaptured funds, the vice hereinbefore commented on of the Howell bill, by substituting a loan to a carrier for an investment by the government in the property of the carrier, making, in their proposal, the government a lender, whereas under the proposal of the Howell bill the government would become an investor. The commission's plan thus avoids the gradual acquisition by the government of a proprietary interest in the railroad property. It is true the commission's proposal does contemplate the purchase of equipment to be leased to the carriers, but the government's property in such equipment is distinctly earmarked and separated from the carrier's property. Accord-

ingly the commission's plan does not constitute so insidious an approach to government ownership as do the proposals of the Howell bill and, in fact, the principle, as to such equipment, is already contained in existing law.

There are, however, two fundamental objections, as it seems to us, to the proposals of the commission. The first is the retention of the rate base as the measure of a "fair return" and as the measure of recapture, the constitutional weakness of which we have hereinbefore discussed, and the other is the period of time which the commission proposes to use in order to ascertain whether or not there are recapturable amounts. The commission proposes a three-year period, which is a liberalization in the right direction of the present law and of the proposal of two years in the Howell bill. It seems to us, however, that a three-year period is not long enough. The object in using more than one year is to prevent the injustice which might come from one year's being exceedingly prosperous and calling for recapture, while the next or succeeding years might be characterized by substantial falling off in business, with earnings to the carriers subject to recapture in the former year but far below a fair return in these succeeding years. The injustice of making such a carrier surrender excess earnings in the first year, with no provision for the deficit in the other year or years, is perfectly obvious. A sufficiently long period should be adopted to make certain that in ordinary experience the period will embrace, reasonably and fairly, periods of prosperity as well as periods of adversity, and no period less than five years can, according to our experience, be fairly counted on to embrace both extremes. Even that period would not certainly be sufficient to accomplish the purpose. Nothing short of it, however, should be considered or prescribed.

Roads to Ask Change in Recapture Base

Moreover, if recapture is to be insisted on, it seems proper to state that a number of the roads will desire to insist at the hearing that, as to the past, the whole period since the enactment of the Transportation Act of 1920 should be averaged so as to ascertain whether any part and, if so, how much of the earnings is subject to recapture. They will desire to point out that it required more than five years after the expiration of federal control before any considerable number of the carriers began to earn even approximately a fair return, and that it is quite certain that at least 90 per cent of the carriers were far below a fair return for the years 1920 to 1924, inclusive. The first five years after federal control being for the most part lean years, in which, as to at least a large number of the carriers, there was a deficit of earnings below a fair return, it would seem only fair to throw together these five years, mostly lean, with the five spotted years from 1925 to 1929, inclusive, and ascertain by an average for the period whether or not, as to any carrier, there is an amount subject to recapture.

Restrictions in the Howell Bill

In paragraph (7), beginning on page 9, the bill undertakes to provide as to how the carriers may assert their constitutional rights when invaded as a result of rates fixed by the commission under the bill. It is quite significant that the bill should undertake to make provision on this subject, and it is difficult to escape the conclusion that the authors of the bill found themselves consciously face-to-face with grave questions of constitutionality when they made the proposals which the bill contains. The apparent purpose, and certainly the effect, of the provision in respect to the assertion of constitutional rights, is to interpose difficulties and obstacles in the way of ascertaining these rights and obtaining constitutional protection.

The commission, in expressing its conviction that its plan as to a rate base is constitutional, may have had in mind only that aspect of the matter which relates to group rate-making, and is perhaps fascinated with the conception that any convenient mechanism desired may be set up by Congress for that purpose and does not become unconstitutional unless a result worked out under it invades the constitutional rights of an individual carrier. Objections to even this view have hereinbefore been stated; but it is difficult to understand how the commission can reach the conclusion that a rate base, arrived at by ignoring elements which the law requires to be considered in arriving at value, and hence different from value, can be a constitutional measure of the amount of a carrier's earnings subject to recapture, when the Supreme Court has just decided exactly the reverse in a recapture case, in which the power now approved by the commission was asserted and sought to be exercised by it.

Mr. Fulbright pointed out that officials and com-

mittees of the league had already been giving consideration to this bill. It was made the subject of conference by the legislative committee and executive committee at a meeting in Washington, on April 7, at which time the committees went on record as being opposed to the bill upon the ground that its provisions were contrary to the principles which have heretofore been advocated by the league. The executive committee at that time directed Mr. Fulbright to prepare a brief resumé of the provisions of the bill with comments embodying the opinion of the committees, which statement was subsequently prepared and distributed to the members, and a copy of which was also sent to the Senate committee. "Apparently S. 4005 is based upon the same general policies which brought about the enactment of Section 15a in the Transportation Act 1920," he said, "with the exception that a more definite and substantially different direction is given to the commission for determination of the basis for adjusting freight rate levels and for recapture of earnings by the government and with the further exception, or rather addition, of a scheme for enlarging the possible activity of the government in the acquisition and control of railroad properties." The statement continues in part:

The National Industrial Traffic League was opposed to the principles of Section 15a at the time it was enacted but did not make any extensive fight against them, primarily because it was realized that measures had to be taken to protect the revenues of the carriers when their properties were turned back to the owners.

The first pronouncement made by the league on the subject was at a special meeting of the membership in Washington January 27, 1922, after the proposals had been discussed at a previous meeting in November and made the subject of study by committee and counsel in the interim. At that time Section 15a was condemned as being economically unsound and the recapture provisions were particularly condemned as being socialistic and impractical. The first opportunity the league had to present to the Senate its views upon the subject was in April, 1924, when consideration was being given to a bill to repeal Section 15a.

At that time we pointed out among other things that the literal effect of Section 15a would be to require the commission to lower the freight rates when traffic was moving freely and in large volume and to raise the rates in times of great financial stress when there was little traffic available to be carried. In other words, it set up a rate base, namely, the aggregate value of the common carrier properties, and directed the commission to so adjust, initiate and modify the rates that carriers might as nearly as possible earn a fair return upon such aggregate value at a given time. Literally it provided for day-to-day regulation and at least seemed to require that from year to year the commission should revamp and revise the rate structure to adjust the rates to the scheme indicated.

The effect of the direction ran right into the teeth of fundamental economic principles.

The commission has never undertaken to follow out literally the directions of Section 15a. The only excuse it has for not doing so is that they are economically unsound and wholly impracticable. To illustrate; when the Transportation Act was enacted in 1920 business was booming and commerce moving freely with high prices. Freight rates cut but little figure in the picture. The commission, following the mandates of this legislation, had instituted hearings and within an incredibly short time, considering the magnitude of the problem, issued an order permitting a general increase in freight rates throughout the country ranging from 25 to 40 per cent in various major territories, and these increases became effective in August of that year.

In the proceeding in 1922 the commission had before it the returns of the carriers showing that they were not beginning to make a fair return upon their properties. It confronted a mandate from the Congress of the United States to so adjust the rates from time to time that the carriers as near as may be should earn such a return. The commission knew full well that it would be impractical to undertake any such matter under the conditions then existing and it reasoned that during the economic depression traffic was being kept off of the rails on account of the excessive level of freight rates which had been devised to fit the conditions

existing in the Spring of 1920. The commission did the only logical thing for it to do, namely, to order a general reduction in freight rates but under the literal interpretation of that law it would seem they should have made a further increase in the same. From the beginning of its history until the present date it has been demonstrated that Section 15a is an impractical theory and that freight rate levels cannot as a practical matter be moved up and down to fit the changing economic conditions in all or a part of the industries of the country.

The proposed bill does not get away from these fundamental fallacies but simply reiterates them and undertakes to soften the blow a bit by providing a two-year basis for determining recapture funds. This may be a slight deviation but the basic fallacies are still existing and the law will prove no more practicable of application than has the law of 1920.

The National Industrial Traffic League is an organization of shippers and approaches the question involved in Senate bill 4005 solely from the standpoint of the shipper and his ultimate best interest. Of course, it is further recognized that among the interests of the shipper is the importance of preserving an effective and efficient transportation machine as well as the enjoyment of the lowest reasonable transportation costs compatible with the public interest. It is fundamentally important that the rate structure shall be so adjusted as not to restrict, retard or destroy the freedom of movement of commerce between the states. What the traffic will bear and what the needs of the carriers are must be primary considerations.

It is generally considered that the present bill is born of a desire to circumvent some of the possible effects of the decision of the Supreme Court of the United States in the St. Louis & O'Fallon Company case 279 U. S. 461. It is probably correct to state that a large majority of the shippers, including the members of this organization, believe and feel that a more equitable and correct basis for ascertaining value would be the so-called prudent investment theory expounded by the minority members of the Supreme Court in various decisions. Whatever may be their view, however, the fact remains that the Supreme Court, within its proper province has been called upon to define the elements to be considered in the ascertainment of value and to pass upon the consideration given them by the Interstate Commerce Commission.

Proposed Rate Base a Substitute for Value

It is not the purpose of this communication to enter into a discussion of the law questions involved in an effort to enact legislation which will circumvent the effect of that decision but we merely wish to point out that the proposed bill, if enacted, would not result in clearing the atmosphere or abating the uncertainties which confront business and shippers of today. It is the opinion of eminent counsel that Congress cannot by legislative fiat arbitrarily define value. It cannot add to or subtract from the elements that must enter into the consideration of value of a given property at a given time. Ostensibly the bill gets away from ascertainment of value by providing for ascertainment of a so-called "rate base," which admittedly may be something different from value. Definite rules are promulgated under which the so-called rate base must be ascertained. This rate base is used in the two important ways in which value has heretofore been used under Section 15a, and as it has been recognized from the beginning of railroad rate regulation in this country, namely, first, to determine the level of freight rates and the amount of revenues or income the carriers are entitled to receive, thereby placing limitations upon the net return to the owners of their properties, and second, to carry out the principle first announced in Section 15a of extorting from the more fortunate carriers whose lines have been most judiciously located and efficiently managed, a part of their income for the purpose of creating a fund to be held by the government and administered in accordance with the dictates of Congress from time to time. It is thought that the courts will no doubt look through the form of the bill to the substance and will see that this so-called rate base is merely adopted as a substitute for value and will hold that it is subject to all of the legal objections which were found to apply to the decision of the commission in the St. Louis & O'Fallon case.

At any rate we may look forward to extended litigation, not by one but by many carriers throughout the country and this litigation will be conducted at great expense, all of which will be borne by the public. Even should the law be enacted and thereafter sustained, the duty will be upon the commission to ascertain the value, in accordance with

the principles therein set forth, of every carrier in the country and to revise that value from year to year thereby creating a definite rate base. While a great deal has been done to accomplish this task at an expense of one hundred and sixty million dollars to the government and the railroads, nevertheless there will no doubt be hundreds of cases where the findings of the commission will be questioned and carried to the courts and the situation will still be uncertain.

But even if all of this be finally adjusted and the last picture has been painted it will still be demonstrated that the law is impracticable and that freight rate structures cannot be juggled about to fit the rapidly vacillating revenues from year to year and from season to season. It will still be subject to the vicious principle that in times of distress when industry needs help with moderate rates the carriers may perforce go into the courts and demand their pound of flesh by the establishment of higher rates if the commission does not carry out the mandate contained in the bill to so adjust the rates. The rate base will be determined and the amount of return will be determined and it will be a comparatively simple matter for the carriers to compel the commission to bring about great increases of freight rates in times of economic distress while on the other hand, the carriers will in turn be at the mercy of the commission and the public in times of business prosperity when commerce reaches peak volume and moves with greatest ease.

There was some excuse for Congress to adopt such a measure when it acted upon the Transportation Act in February, 1920, but there is no such excuse today. It is time for us to get away from the whole bundle of fallacies which were handed to the public in Section 15a and learn that the simple promulgation of theoretical formulae is no way to solve the transportation problems.

After all is said and done, no matter what rule of rate making may be promulgated by the Congress, the insuperable force of basic economic law will assert itself. Furthermore it is most important that considerations of reasonableness of charges, of the necessities of commerce, of what the traffic will bear and move freely through the areas and through the channels which will best serve the public, and of what competition must be met to keep the traffic upon the rails of carriers, are also of importance as well as the question of aggregate value and standard return. Irrespective of this value the carriers will not be able to prosper in seasons of industrial distress like the present and certainly no law should be enacted which would hamper their ability to enjoy prosperity with other industry when times of general prosperity are at hand.

Recapture Clause Unsatisfactory

The recapture clause has not worked out in the manner its framers intended. It has very frequently penalized minor carriers for temporary periods of prosperity and the major carriers can so set up their accounts as to greatly minimize the recapturable sums. Furthermore, when a carrier finds that it is likely to be in danger of a recapture claim there is an inducement to build up the operating expenses unduly and to make improvements which under the leeway permitted in the accounting rules, will result in a substantial improvement of the properties and undue reduction of the net income which the law contemplates the carriers should receive.

Revision of Section 15a Proposed

The shippers represented by this organization have never been satisfied with Section 15a, but on the other hand, they feel that your committee is entitled to have constructive suggestions as well as criticisms of existing and proposed legislation. Accordingly, we are submitting herewith a proposed bill to revise Section 15a by substantially changing the provisions with respect to the basis for adjusting freight rates and by repealing *ab initio* the recapture clause.

It will be noted that the bill recognizes the principle of group rate making and the propriety of having the commission undertake to fix rate levels to meet the needs of the carriers and the public from time to time. It also provides that the commission shall find and make public from time to time what returns will in the judgment of the commission meet such requirements. The bill undertakes to get away from the necessity to find and promulgate exact rate bases, which according to the experience of the past ten years have been found to be impracticable. It leaves the commission free to take into consideration all of the factors that may enter into the ascertainment of proper rate levels and permits them to exercise their common sense judgment from time to time.

For more than forty years the commission has been

building up valuable statistical information and important precedents and has been developing expert, trained technical minds to cope with the problems involved. It has not hesitated to call upon the shipping public and the carriers for expert assistance and advice as new problems arose and the League believes that by reason of this background of experience, as well as the present splendid equipment and personnel of the commission, the best possible method of handling the problems is to change the law so as to give the commission a broader discretion and to get away from hide-bound formulae which experience has proven to be impracticable. At the same time we do not believe anything should be done which would tend to restrict or impair the constitutional rights of the investors in the properties devoted to the public use and to this end we believe that it is perfectly fitting and proper that the commission from time to time undertake to ascertain the needs of the carriers of the country as well as those of the shipping public. The bill we would propose merely lays down certain general principles for the guidance of the commission which principles have been recognized for a generation in one form or another.

We therefore respectfully ask that your Committee give consideration to the suggestions of this organization upon the subject involved.

Emergency Rates for Drought Relief

WASHINGTON, D. C.

PRESIDENT Hoover announced on August 19 that he had received from all sections of the drought area "high appreciation of the railways for their prompt and constructive action" in reducing rates to assist in relieving conditions caused by the drought, and characterized the action as "a notable act of courageous co-operation undertaken in the face of seriously reduced income due to the depression." "It emphasizes," he said, "the public interest of maintaining the strength and financial stability of our railways that they shall be able to co-operate in times of national difficulty."

The emergency freight tariff of the railroads in Official Classification territory, providing for a 50 per cent reduction in rates on livestock feed, hay and water shipped to drought areas and on livestock shipped from drought areas to feeding points, was filed with the Interstate Commerce Commission on August 16 by B. T. Jones, agent for the Central Freight Association lines, W. S. Curlett, agent for the Trunk Lines, and F. Van Ummersen, agent for the New England Freight Association Lines, effective at once, in accordance with the plan outlined in last week's issue. The tariff is to expire October 31.

The tariff applies on movements to and from drought areas described in certifications of counties by the Department of Agriculture in C. F. A., Trunk Line and New England territories, when shipments are covered by permit issued by the transportation office of the delivering carrier as provided in the embargo notice issued simultaneously by the Car Service Division of the American Railway Association. The tariff also included a list of the grain and grain products articles which are to be included within the term "feed."

The emergency rates are to be 50 per cent of the current freight rates except that where no commodity rates are in effect on water the rates will be based on a mileage scale beginning with \$7.50 per car for hauls of 15 miles and less and running up to \$40 per car for hauls of 125 to 150 miles, for single line hauls, no switching charge to be absorbed.

The lines in Southern Classification territory on

August 18 decided to adopt the plan of the eastern roads, except that they limited their reduced rates to hay, feed and livestock, omitting the water. The tariff was filed with the commission on August 19 by Agent F. L. Speiden and the embargo notice of the Car Service Division was amended to make it applicable to the southern lines.

Plans for federal and state organizations to handle drought relief work were agreed upon at a conference with President Hoover attended by the governors or other representatives of 13 states at Washington on August 14. Each governor who considers that a situation requiring emergency relief exists within his state was to create a drought relief committee under the chairmanship of a leading citizen and including a state agricultural official, a leading banker, a Red Cross representative, a railway representative, and such farmers and others as the situation may require, to take charge of relief measures within the state. The state committees are in turn to organize county committees for those counties where there is need for organized relief, to receive individual applications for relief. The President announced that he would set up a corresponding committee comprising representatives of the Department of Agriculture, the Federal Farm Board, the Federal Farm Loan Board, the Red Cross, the American Railway Association, and the Public Health Service, which, through its chairman, will co-ordinate national activities and national support to assist the state and county committees.

Methods for provision of credit beyond local or state resources for the purchase of feed, seed, movement of livestock, or support of families over the winter, are to be developed by state committees in co-operation with the Federal Farm Board, the Federal Farm Loan Board, the Intermediate Credit System, and other federal agencies. President Hoover mentioned reduced railway rates as one of the measures of relief, saying that the railways had "already generously reduced rates by 50 per cent" on food and feed inward and livestock movement outward, to dealers and persons who are entitled to relief and so designated by the county agents or the committees created.

The Department of Agriculture will secure and disseminate information as to sources of feed supply and localities to which livestock may be shipped and will examine the possibilities of advancing state road allotments to drought areas in order to increase employment. Following its original certification of 198 counties in five states as those entitled to reduced freight rates, the Department of Agriculture on August 13 issued another list adding 4 counties in Pennsylvania, 86 in Kentucky and 31 in Tennessee, making a total of 319 and on August 18 an additional 171 counties were added to the list, including 74 in Arkansas, 61 in Missouri, 31 in Illinois, 4 more counties in Ohio and 1 more in Virginia.

Before the relief organization work had been completed a considerable amount of rainfall had occurred in much of the affected territory and the Secretary of Agriculture stated on August 18 that "we can regard the corner as having been turned, so far as the continuation of the drought is concerned."

On August 19 the President announced the appointment of the National Drought Committee, with R. H. Aishton, president of the American Railway Association, as a member. Regarding the latest reports as to the situation he said: "Continuing reports confirm the severity of the situation and the inevitability of distress over the winter in the acutely affected counties which now apparently number something over 300. The rains of the last few days have stemmed the spread of the

drought and greatly improved the situation outside of the acutely affected area. In those areas the destruction of crops has proceeded to a point that is beyond any great degree of recovery, although pasturage should improve. It must be borne in mind that from a relief point of view the burden of the problem in the acute area will show very much more vividly over the winter than at the present moment."

The Secretary of Agriculture on August 16 authorized the apportionment of federal funds for highway improvement in the fiscal year ending June 30, 1932, so as to make it possible for the states to anticipate the federal funds which would be paid them next July and enable them to expand and advance their own highway programs so as to provide emergency employment. The amount available for allotment is \$121,875,000 and the states are required to match the federal payments to obtain the funds.

Secretary Hyde on August 19 authorized the county agricultural extension agents in the designated drought counties to approve applications for reduced railroad rates on the designated commodities when the benefit of such reduced rates accrues to the farmer-consumer of hay, feed and water and the farmer-shipper of livestock in the drought-stricken area. The director of extension in each state is authorized to nominate a person to represent the department for this work in counties without county extension agents.

The department's representative will investigate each application to ascertain whether or not the conditions are such that the reduced rates apply. His certificate must be filed with the local railroad agent previous to the movement of the commodity from the point of origin. The final decision as to the application of the reduced railroad rates in each case is made by the railroads. The reduced rates apply only when an emergency caused by the continued drought makes the shipment necessary. The rates are not applicable on livestock shipped to market or the movement of hay and feed in the normal channels of trade.

Persons desiring to obtain a permit authorizing the movement of the designated commodities must first obtain approval certificates from the agricultural extension agent of the county or other representative named by the state extension director to represent the United States Department of Agriculture.



A Main Line of the German National Railways in the Black Forest

Revision of Cotton Rates Prescribed

WASHINGTON, D. C.

THE Interstate Commerce Commission on August 20 made public its report on Part 3 of its general rate structure investigation, involving cotton rates in the Southeast, Southwest and Mississippi Valley territories, with which were combined many separate complaint cases. The commission finds that the present adjustment within and from southeastern and Carolina territories is not unreasonable or otherwise unlawful but rates in the Mississippi Valley and to the remainder of southern territory and to official territory are found unreasonable to the extent that they exceed rates based on mileage scales of any-quantity rates, which represent a general reduction. Distance scales of any-quantity rates are also prescribed for general application within the Southwest and from the Southwest to southern and official territories, approximately 10 per cent higher than those prescribed within and from the Mississippi Valley, and these include some increases.

The report is by Commissioner Woodlock. No dissents were expressed but Commissioner Brainerd, concurring in part, objected to the imposition of rates on cotton moving from the Southwest on a level 10 per cent higher than that charged on cotton shipped from the South. He said this spread was based largely on the commission's action in the consolidated southwestern cases in which it realigned the class and other rates on a level approximately 10 per cent higher than in the South, but he expressed the opinion that rates in the Southwest should be prescribed on a basis no higher than in the South and in no event on a basis more than 10 per cent higher. The conclusions differ in part from those of the examiner's proposed report. The rates are to be effective on January 10.

Most of the complainants in the case had urged material reductions in the cotton rates to place them upon a proper level in relation to other descriptions of traffic, while the carriers insisted that they are not out of line with rates on other traffic and those west of the Mississippi contended that an increase is justified.

The report says the complaints presented a general attack on the level of the cotton rates from all points of origin to all ultimate destinations to which cotton moves in substantial volume and to the ports, and a general attack upon the relation which cotton rates generally bear to the rates on other commodities. The Hoch-Smith resolution was invoked only in the complaints of the Oklahoma and Mississippi commissions. As to this the report says:

"Since the submission of this proceeding the Supreme Court has construed the Hoch-Smith resolution and found that it makes no substantial change in the existing law. Economic evidence bearing upon the question of depression in the cotton-growing industry, which was confined to Oklahoma and Mississippi, is discussed in Appendix F. From this evidence we conclude that no substantial depression was shown to exist at the time the hearings were closed. But even if our conclusions were otherwise we could not, in view of the decision of the Supreme Court above mentioned, accord cotton special treatment in the way of a lower level of rates than would have been possible prior to the adoption of the resolution."

After a discussion of the evidence presented by the roads as to their deficiency in the rate of return the report says: "General considerations of the character discussed are entitled to weight but they are not controlling

in dealing with the rates on an individual commodity." Extracts from the conclusion expressed are as follows:

Upon consideration of the entire record bearing upon this phase of the proceeding, and giving due weight to the fact that cotton is a basic agricultural product, and also to the fact that it is a commodity of relatively high value, which, by reason of its natural characteristics, and the practices inherent in present methods of its production and marketing, requires transportation services which are expensive to such an extent as to distinguish it to a degree from the general run of other traffic, we are of opinion and find that the present all-rail rates on cotton within and between the southeastern and Carolina territories, and from those territories to points in official territory as described in *Eastern Class Rate Investigation*, 164 I. C. C. 314, are not unreasonable nor are they unduly prejudicial to cotton and preferential of other descriptions of traffic. The bases for these rates are not identical in all respects with those which we would prescribe if we were initiating rates on cotton. In view of the absence of showing of any real unlawfulness in the present rates, however, and giving due consideration to their history and the facts that on the whole they appear to meet the needs of the traffic in a reasonably satisfactory manner, and that there is no demand for a revision by state commissions or shippers other than the complainants and even the latter are not particularly interested in a revision unless it involves a reduction, we are not disposed to attempt to effect a revision merely to bring the rates more nearly in line with our own ideas, and we accordingly leave them as we find them.

With respect to the Mississippi Valley the situation is different. We have had presented, since the service of the proposed report, data which forms a better basis for comparison of the rate levels in the Valley and the Southeast than anything theretofore available, and which warrants the conclusion that the Valley level is materially higher than that in the Southeast. As we have previously noted, the record contains evidence of certain differences in the handling of the cotton traffic in the Valley and the Southeast but so far as transportation conditions generally are concerned there is substantially no difference in these sections as is evidenced by the fact that in various proceedings of a general nature we have prescribed the same bases of rates for application throughout southern territory.

Being of opinion, as we are, that the southeastern rates are upon a maximum reasonable level, and that the existing difference between the levels in the Valley and in the Southeast is excessive we find upon the present record that the all-rail cotton rates within the Mississippi Valley, and from that territory to southeastern, Carolina, and official territories, notwithstanding that they have been largely prescribed or approved by us in former cases, are unreasonable. A revision of these rates is necessary to remove unlawfulness which we find to exist. We accordingly find that the maximum reasonable bases for any-quantity, all-rail, carrier-privilege rates applicable in connection with compression and transit arrangements substantially identical with those which at present obtain, for the transportation of cotton between points in the Mississippi Valley and from points in the Mississippi Valley, to points in southeastern, Carolina, and official territories, are and for the future will be the distance scales for both single and joint line hauls shown in Appendix G.

It is not our intention that the present group adjustment shall be supplanted by a strict distance basis. The present grouping is of long standing and no one seeks to have it changed. It will therefore be considered as a proper compliance with our findings if grouping generally similar to that which at present obtains is continued, the rate from one group to another to be substantially equal to the average of the distance rates under the scale from and to all points in the groups, respectively.

Due largely to the nature of its evolution, the cotton-rate structure within and from the Southwest, in addition to the improper relation between the rates from Oklahoma and adjoining states previously referred to and fourth-section departures mentioned in connection therewith, contains numerous irregularities and inconsistencies involving rates that are too high in some instances and too low in others, and in many respects is not in consonance with accepted standards. It is appropriate at this time to provide a reasonable maximum basis for use in the construction of the cotton rates which shall not only correct the unlawful conditions now existing but which shall be consistent and uniform within itself and properly related to the basis which has been prescribed herein for application within and from the Mississippi Valley.

The scales for the Mississippi Valley apply both to single and to joint-line hauls, whereas in the Southeast different scales apply for single and joint-line hauls.

The new Mississippi Valley scale is also graded differently from the southeastern scale but is designed, as nearly as may be, to reduce the Mississippi Valley level only enough to put it on approximately the same level as obtains in the remainder of southern territory. Interterritorial rates are made by the application of a basic scale, designed to reflect the proper level for the lowest rated territory through which the shipment moves, with differentials to be added for the portions of the haul which are in higher-rated territories.

No differentials are prescribed for application in Texas and Oklahoma differential territory. Continuation of present grouping on the basis of the average scale rates is permitted except that groups and group rates are prescribed from the southwest to Houston, Galveston and Texas City, which three ports are grouped at the same rates for distances in excess of 200 miles from Houston. C.I.T. rates include the full compression charge in all instances; compressed rates are made 18 cents (the amount of the compress charge) less than c.i.t. rates; and uncompressed rates grade up from 11 cents under the c.i.t. rates at 5 miles and less to 12 cents over the c.i.t. rates for all distances in excess of 160 miles.

Under the present adjustment the c.i.t. rates from Texas to the ports grade up as the distance from the ports increases, to 81 cents at 210 miles, and the 81-cent rate is blanketed over a large part of the remainder of the State. The two principal groups in Oklahoma to the Texas ports, one comprising a large part of the eastern portion of the state and the other a large part of the western portion of the state at present take rates of \$1.02 and \$1.075, respectively. The prescribed scale of c.i.t. rates reaches 81 cents at 300 to 325 miles, 91 cents at 475 to 500 miles and 97 cents at 500 to 600 miles.

The Texas rates will be reduced for the shorter hauls and increased for the longer hauls. For a distance of 210 miles to the ports where the 81-cent blanket rate now begins the scale rate will be 71 cents. From El Paso to Galveston the scale will produce a c.i.t. rate of approximately \$1.12 as compared with the present rate of 94.5 cents. The nearest point in Oklahoma to Houston is approximately 340 miles so that the rates from Oklahoma to the Texas ports will range from 84 cents to \$1 as compared with the present rates from the two principal groups in that State of \$1.02 and \$1.075. It is expected that the new rates will produce a reduction in the carriers' revenue but it is impossible to say how much.

All the rates prescribed are made in the light of a continuation of the present compress charges and the present concentration and transit arrangements.

It is found that a relation of rates from Oklahoma on the one hand and Arkansas and Texas on the other hand to the Texas ports less favorable to Oklahoma than would be produced if the rates prescribed as reasonable were applied from all three states will be unduly prejudicial under section 3 to Oklahoma as compared with Arkansas and Texas interstate, and unduly preferential of intrastate traffic under section 13 as compared with Texas intrastate rates.

The adjustment from the Mississippi Valley is found to prejudice Mobile and prefer New Orleans and the rates to these two ports are required to be related as the scale would relate them provided that equalization is permitted when the distance is not in excess of 25 per cent. It is also found that from southern territory it will be unduly prejudicial for carriers serving both New Orleans and Mobile to accord the former substantially more favorable transit arrangements than they do the latter. Rates to Mobile and to other Gulf ports from

the southwest are also required to be related as the scales would relate them and Mobile is required to be accorded transit arrangements on southwestern cotton equally as favorable as those accorded New Orleans by carriers serving both ports.

Consideration of rail-and-water cotton rates is deferred for the present.

Government Accident Report for 1929

THE Interstate Commerce Commission has issued accident bulletin No. 98 containing a summary of accidents reported by the steam railroads of the United States for the 12 months ending with December, 1929. The last two annual reports preceding this, based on preliminary memoranda issued by the commission in advance of the regular reports, appeared in the *Railway Age* of April 14, 1928, page 854, and April 6, 1929, page 782.

The first and most notable item in the present report shows the total number of passengers killed in train accidents in the calendar year to have been 36. The remarkably low record of 1927 has not been reached, but the total, 36, still stands as only one more than half the average annual number of passengers thus killed in the four years prior to 1927. The safety of passengers in trains is, of course, a primary object in railroad operation and the figures for successive years have long been watched with much care. A significant element, however, which is emphasized in the recent reports of the Interstate Commerce Commission, is suggested in the statement of the number of persons, regularly reported as injured, who subsequently died. The present report shows no less than 515 persons who had been reported as injured but who in supplementary reports were recorded as having died; 15 passengers, 130 employees and 370 other persons. Twenty-four of these cases were charged to train accidents and 491 were train service accidents. In the year preceding, the total in this table of subsequent deaths was 498, composed of 24 passengers, 114 employees and 360 other persons. Of these cases, 26 are charged to train accidents and 472 to train service accidents.

The principal train accidents in which occurred the fatal injuries to passengers in 1929 were, February 20, Peoria, Ill., six passengers killed; July 18, Stratton, Colo., eight passengers killed; August 18, Henryetta, Okla., 12; December 1, Onley, Va., eight. The suggestion that the falling off in the annual record of fatalities to passengers is mainly a result of fewer passengers traveling by railroad would appear to call for little consideration, for the reason that passenger train mileage, which is a main factor in comparing the record of collisions and derailments, has not undergone any marked decrease. We may fairly say that we have fewer deaths of passengers because passenger trains are run more safely than in former years.

The total amount of damage to cars, locomotives and roadway because of collisions and derailments, was about the same in 1929 as in 1928—nearly twenty million dollars. The figures for the two years are:

	1929	1928
Collisions	\$4,645,176	\$4,755,833
Derailments	13,137,632	13,124,511
Other train accidents	1,592,952	1,608,097
	\$19,375,760	\$19,558,441

Loss and damage to freight, and sums paid or payable on account of fatal and non-fatal injuries to passengers, employees or other persons are not covered by this report.

The principal totals from the present bulletin are shown in Table A, below. The item "other persons" includes persons carried as passengers on contract, such for example, as news dealers, employees not on duty, and miscellaneous persons both trespassers and non-trespassers. The largest single element in this item is that based on deaths and injuries at highway grade crossings.

Deaths and injuries at highway grade crossings as shown in the present report and in the report for the two years last preceding, are as follows:

	Killed	Injured
1929	2,485	6,804
1928	2,568	6,666
1927	2,371	6,613

Of the 6,804 here recorded injured, 210 are reported as having subsequently died.

The bulletin, discussing causes of railway crossing accidents and possible measures of relief, calls attention to the fact that the safety record with respect to pedes-

Table A.—Casualties on Railroads, Three Years

	1929 Bulletin No. 98	1928 Bulletin No. 97	1927 Bulletin No. 96			
	Killed	In- jured	Killed	In- jured	Killed	In- jured
<i>Passengers</i>						
In train accidents.....	36	1,742	16	1,404	10	1,511
Train service accidents.....	61	2,101	67	2,055	69	2,375
Total train and tr. serv.	97	3,843	83	3,459	79	3,886
Non-train accidents.....	3	528	2	568	3	674
Grand Total, passengers.	100	4,371	85	4,027	82	4,560
<i>Employees</i>						
In train accidents.....	160	1,005	138	1,126	194	1,211
Train service accidents.....	909	20,965	824	22,465	972	26,715
Total train and tr. serv.	1,069	21,970	962	23,591	1,166	27,926
Non-train accidents.....	279	38,120	281	46,101	324	59,642
Grand Total, employees.	1,348	60,090	1,243	69,692	1,490	87,568
<i>Other Persons</i>						
In train accidents.....	130	537	118	343	82	350
Train service accidents.....	4,836	10,349	4,981	9,994	5,055	10,452
Total train and tr. serv.	4,966	10,886	5,099	10,337	5,137	10,802
Non-train accidents.....	82	1,648	82	1,505	112	1,880
Grand Total, "other persons".....	5,048	12,534	5,181	11,842	5,249	12,682
<i>Total, All Classes of Persons</i>						
In train accidents.....	326	3,284	272	2,873	286	3,072
Train service accidents.....	5,806	33,415	5,872	34,514	6,096	39,531
Total train and tr. serv.	6,132	36,699	6,144	37,387	6,382	42,603
Non-train accidents.....	364	40,296	365	48,174	439	62,196
Grand Total	6,496	76,995	6,509	85,561	6,821	104,799

trian fatalities shows no improvement. Any method employed to safeguard the automobile driver is also a protection to the pedestrian but the record of pedestrians killed and injured shows no evidence of the desired improvement. Thus, the number of killed (the number of injured being uniformly a little less than the number killed) was, for five years, as follows: 1925, 299; 1926, 300; 1927, 304; 1928, 303; 1929, 317. And, says the report, "If the safety record for pedestrians, based upon the slow movements of an individual, cannot be improved in a more material fashion, the outlook for improving the record of automobilists, with the larger number of persons exposed per accident and the extra-hazards created by machine operation, does not seem bright."

In the casualties reported under the head of getting on or off cars or locomotives, and struck or run over, not at public crossings, all suicides or attempts at suicide, are excluded. These, for 1929, are stated in a foot note to aggregate 181 fatal and 16 non-fatal cases.

Communications and Books

On Government Ownership

WASHINGTON, D. C.

TO THE EDITOR:

On page 264 of the *Railway Age* of August 9, under the article "Retirement of Mr. Woodlock", there appears this reference to Commissioner Eastman: "He is, however, an advocate of government ownership of public utilities and railroads; and the policy of regulation favored by him reflects his somewhat socialistic views".

Do you know that as far back as 1913, approximately 50 per cent of the railway mileage in the principal countries of Europe, America (with the United States, of course, excepted), Asia, Africa and Australasia, was government owned? Also that approximately 75 per cent of the railway mileage in these same countries (including the United States) was either government owned or government regulated?

Does it not seem rather far-fetched to call government ownership of railroads "somewhat socialistic", when so many civilized countries have been indulging in this pastime for so long?

As very few Americans are aware of this somewhat socialistic attitude of so many other civilized countries, will you kindly print this letter in your valued journal, so that your readers may have the above statement of facts for their consideration.

H. O. WEISS.

(EDITOR'S NOTE: Yes, the *Railway Age* was quite fully informed regarding the extent of government ownership of railways in the world before it received Mr. Weiss' letter. We do not see what bearing this has on the question as to whether Commissioner Eastman's views are socialistic. Socialism is defined as: "The joint ownership by all the members of the community of the instruments and means of production". Railroads are among the instruments and means of production. It must follow that government ownership of them is socialistic, and that anybody who advocates their ownership by the government expresses socialistic views. It does not follow, however, that because many other countries have adopted government ownership it is desirable in the United States. As Mr. Weiss evidently believes that the information he gives will dispell the darkness in which most of our readers live we gladly publish it; but we doubt if many of our readers will find much in it that they did not already know, and in view of the fact that, under private ownership of railways, the income of all classes of the people of the United States is greater than the income of corresponding classes of people under government ownership in other countries, we also doubt if Mr. Weiss' letter will make many converts to government ownership.—EDITOR.

New Books

The Problem of Weak Railroads, by James M. Herring. 176 pages. 8½ in. by 5¾ in. Bound in cloth. Published by the University of Pennsylvania Press, Philadelphia, Pa. Price \$3.

The fate of financially weak railroads has become the subject of numerous discussions since the passage of the Transportation Act of 1920 with its provisions designed to perpetuate these unprofitable lines in the interest of the country's transportation system as a whole. The present work is an examination of these provisions and an appraisal of their adequacy for the solution of the weak railroad problem. After his general survey of the situation the author finds that causes of weakness in railroads are so varied that the problem of preserving weak carriers is really not one problem but many problems. In some cases the use of arbitrariness and the division of joint rates in the interest of weak lines are found to have been helpful but to present difficulties in the way of general application. It is pointed out, however, that there remains a solution if the re-

capture and consolidation provisions of the act be made workable. Recapture funds, the author continues, "have been paid by shippers for the maintenance of the transportation system and they should be used in the interests of transportation in general, primarily to aid weak carriers Congress should remove the restrictions upon loans from the general railroad contingent fund The commission's hands should not be tied by impractical requirements in the law." Amendment of the consolidation provisions is also recommended along lines advocated in recent years by the Interstate Commerce Commission, prior to the publication of its consolidation plan.

With the foregoing changes the author feels that the machinery set up in the Transportation Act of 1920 for dealing with weak railroads would be adequate to its purpose and at the same time sufficiently flexible for application to various and individualized types of weak lines.

The Labor Banking Movement in the United States, prepared and published by the Industrial Relations Section, Department of Economics and Social Institutions, Princeton University. Illustrated with charts. 377 pages, 9 in. by 5½ in. Price \$2.50.

While statistics and other material for this survey of labor's experience in the realm of finance were prepared by the staff of the Industrial Relations Section, Princeton University, the report itself was written by Professor J. Douglas Brown, director of the section, with Miss Eleanor Davis, assistant director, contributing chapter V—Unique Features of Labor Banks—and the appendices to the volume. The book is a detailed review of the beginnings, the development, the vicissitudes and the successes and failures of the numerous banks which have been sponsored by labor since the inception of the movement in May, 1920. At this latter time the first labor bank was opened in Washington, D. C., with a capital of \$160,000, and a surplus of \$40,000. At the close of 1920 there were two labor banks with total resources of \$3,628,867, the Engineers National Bank of Cleveland having been established in November, 1920, by the Brotherhood of Locomotive Engineers. The peak of the movement was reached in 1926 when there were in operations 36 labor banks with total resources of more than \$126,000,000; at the close of the first half of 1929 there were 22 with total resources of about \$108,500,000. Since the completion of the study at least one of these latter, affiliated with a railway labor union—the Brotherhood of Railway Clerks National Bank, Cincinnati, Ohio—has passed from labor control. It was sold on July 2, 1930, to the Central Trust Company of Cincinnati.

As railway labor unions, especially the Brotherhood of Locomotive Engineers, under Warren Stone, were among the heaviest plungers, their financial activities are the basis of no small part of the discussion. The influence on other unions of the engineers' early success at Cleveland is traced as well as their later disastrous ventures which culminated in the bursting of their Florida "bubble" and the collapse of many of their pyramided finance companies.

In the same manner the various financial enterprises sponsored by other labor unions during the last decade are passed in dispassionate review and thus, while the student may reach his own conclusion as to the merits of the movement, the study nevertheless suggests in closing that, "The diversions of labor's funds into unsuccessful labor banks while serious, will soon be repaired, except where pension and insurance departments have suffered. . . . The accomplishments of the successful labor banks have warranted the keen interest and enthusiasm they have aroused. As a permanent residual, their continued growth will permit further contributions to democratic banking. But it is the labor movement and its leaders who must consider gravely both the debits and the credits of the experiment. Without the most painstaking examination of the experiences of the past, a revival of the movement of the post-war years would be both dangerous and inexcusable."

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Freight Commodity Statistics, Class I Steam Railways in the United States, Year Ended December 31, 1929, prepared by Bureau of Statistics, Interstate Commerce Commission. Besides the wide formal use of these statements, of which this one is No. 30100 (Sixth in the series), they can be used for informal browsing when one's curiosity is aroused to see how many tons of bottles, jar and jelly glasses, horses, mules, ponies, asses, bituminous coal, tractors and parts, ice, sulphuric acid and paper bags, and the other commodities listed, originate on and are carried by the Class I railroads. 133 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. 80 cents.

Man's Shift from Muscle to Mechanical Power, by Samuel S. Wyer. "Various civilizations developed in the past, finally went through a period of decline and were relegated to the ash heap of history. All past civilizations rested not only on muscle, but also on human slavery. Today's civilization is different from all others in that it has eliminated human slavery and to a large extent muscle, but is making slaves of our energy resources." p. 5. "Effect of transportation and intelligence communication on humanity" p. 21. Pub. by Fuel-Power-Transportation Educational Foundation, Columbus, Ohio. *Apply.*

The Outlaw Years—The History of the Land Pirates of the Natchez, by Robert M. Coates. Maps of the Natchez Trace are used as end-papers, and the book is a history of travel in pre-railroad days and the dangers other than natural to the times and the condition of the road from Nashville to Natchez that disappeared when "steam had conquered the wilderness . . . rails linked the cities in a network no outlaw could hope to break. . . ." p. 302. Illustrated. 308 p. Pub. by Macaulay, New York City. \$3.

Tents of the Mighty, by Donald Richberg. Personal reminiscences of participation in labor negotiations, the National Conference on Valuation of American Railroads, the O'Fallon Case and other recent events. 267 p. Pub. by Willett, Clark & Colby, New York and Chicago, \$2.50.

Periodical Articles

Consolidation for Mastery of the Air, by Theodore M. Knappen. Air transport conditions today and the "four great groups" controlling the major air transport lines. Magazine of Wall Street, August 9, 1930, p. 598-600, 628-629.

Determination of the Constituents of Concrete*, by A. K. Light. "The importance underlying the following method is that it places in the hands of the engineers means whereby he can have a check made on any concrete mix in order to ascertain whether it was made according to specifications. Likewise, it may be used for the purpose of investigation causes of failure in concrete." Foreword. The author is a chemist. Engineering Journal, August 1930, p. 519-520.

Economies of Electric Traction for Trunk Line Railroads, by W. D. Bearce. Gives comparative costs of steam and electric traction and considers gas-electric cars and oil-electric locomotives. Illustrated. General Electric Review, August 1930, p. 456-463.

Magic in Government. "They [the railroads] last year acceded to reductions in grain rates to help the farmer, and yet accomplished little for his relief. They are always willing to serve in the transportation of freight as desired. They are more competent than ever before. . . . But are we not too prone to make appeals to them?" Editorial comment on government drought relief. Commercial and Financial Chronicle, August 16, 1930, p. 998-999.

Traveling Jim Crow, by George S. Schuyler. "Next to being strictly honest, there is no more trying state in this humdrum Republic than being simultaneously a Negro and a traveler." American Mercury, August 1930, p. 423-432.

Volume of Timber Treated in 1929 Greatest in History of Industry. "While crossties still constitute the bulk of material treated each year, it is interesting to note that the ratio in volume of crossties to the total timber treated is decreasing each year." p. 106. Wood Preserving News, August, 1930, p. 106-108.

Looking Backward

Fifty Years Ago

The Flint & Pere Marquette [now the Pere Marquette], extending from Monroe, Mich., to Ludington, 253 miles, with 40 miles of branches, was sold with all its rolling stock and buildings at East Saginaw, Mich., on August 18. Only one bid was made, and that for \$1,000,000.—*Railway Age*, August 26, 1880.

The railway commissioners of Kentucky and the railway companies have agreed on a reduction of passenger rates on all the roads in the state to two cents per mile during September and October, as a preliminary to a permanent reduction from four cents to three cents per mile.—*Railway Age*, August 26, 1880.

The work of grading the line of the Oregon Railroad & Navigation Company [now the Oregon-Washington Railroad & Navigation Company] from Celilo, Ore., to Wallula, Wash., is nearly completed. It is planned to undertake the construction of the rock excavation and tunnels on the line between Portland, Ore., and The Dalles, the latter point being near Celilo, as soon as the eastern portion of the work is out of the way.—*Railroad Gazette*, August 20, 1880.

Twenty-Five Years Ago

Paul Shoup, district freight and passenger agent on the Southern Pacific at San Jose, Cal., has been appointed assistant general freight agent of the Oregon Railroad & Navigation Company at Portland, Ore., to succeed H. M. Adams, who has been appointed assistant freight traffic manager of the Great Northern at Seattle, Wash. J. M. R. Fairbairn has been appointed acting division engineer of the Canadian Pacific, with office at Montreal, Que.—*Railway Age*, August 25, 1905.

The seventeenth annual convention of the National Association of Railroad Commissioners, at which some 20 states were represented, reaffirmed its former demands for rate-making powers for the Interstate Commerce Commission. It also urged additional restrictions on carriers in regard to rate making and publicity of records, and a uniform freight classification for the entire country. The association recommended that each state undertake the work of making a thorough and scientific valuation of all the railway properties in the state, in order to know the cost of reproducing the property.—*Railway Age*, August 25, 1905.

Ten Years Ago

An increase of 12.5 per cent in express rates was authorized by the Interstate Commerce Commission on August 11, which does not take into consideration the award the Railroad Labor Board handed down a few days previously increasing the wages of express company employees by approximately \$33,000,000. It is estimated that the decision will increase the revenues of the express company by about \$36,000,000, or approximately half of the amount which would be raised by the method proposed by the American Railway Express Company.—*Railway Age*, August 20, 1920.

A total of 914,128 cars of commercial freight was loaded on the railroads of the United States during the week ended July 31 as compared with 914,297 for the corresponding week of 1919. The car shortages (deferred car requisitions), which have been showing decreases in recent weeks, are again increasing, in spite of the improvement in transportation conditions. The average car mileage per car per day shows a marked improvement during the month of June. The average for June was 25.1 as compared with 21.4 for June, 1919, and 24.1 for May, 1920.—*Railway Age*, August 20, 1920.

Odds and Ends of Railroading

Railway Home-Run Hitter

Melvin Ott, the star batsman of the New York Giants, was formerly employed as a check clerk on the Illinois Central at New Orleans, La. Even now that he has attained baseball fame, Melvin still works extra on his old job in the winter time.

Getting an Education Under Difficulties

Jack and Tom Beckett, sons of a section foreman of the Southern Pacific at Strauss, N. M., probably did more traveling than any other youngsters during the last school year. The school they attended is 73 miles from Strauss, so that they traveled 146 miles each school day to attend classes. During the school year, they traveled 24,090 miles, or almost the distance around the world.

Rail-Canal Tunnel

On the Alsace-Lorraine railway, between Strasbourg and Avricourt, in the Vosges mountains, there are two tunnels used both by the railway and an adjacent canal. One of these bores is rather short, the other, however, is more than a mile and a half long. The canal is an extremely busy traffic artery, as is the railway. If any reader knows of a similar case in this country, this department would be glad to hear of it.

A River-Going Railroader

While Captain Christian Ingold is not a railroader in the true sense, as a shipmaster and pilot for the Terminal Railroad Association of St. Louis he ranks with railroad men who have out of the ordinary service records. When he was placed on the pension rolls of the company recently Captain Christian had 58 years and four months service to his credit. He joined the Wiggins Ferry Company in 1872, two years before the construction of the Eads bridge over the Mississippi river, and obtained his pilot's license 10 years later.

More About Courtesy

NEW YORK.

TO THE EDITOR:

In your always-interesting and entertaining department, I noted the item regarding friendliness from the observation platform, in which you state that eastern track-gangs evince more cordiality in waving to passenger trains than western trackmen. Singularly, I had always noted exactly the opposite and had assumed that in the east there are so many trains that the trackmen did not bother about saluting, while in the west, the passing of a train is more of an event, and they, therefore, wave more cordially.

FRANKLIN SNOW,
Transportation Editor, Christian Science Monitor.

Adventure of the Lady Passenger and the "Youngest Son"

Ashton Stevens in the Chicago Herald-Examiner, tells a new sleeping car story—if there is such a thing.

It is about Sam Raymond, who was county treasurer and weighed, heavily speaking, a ton, and his friend, Jim Eccles, who was controller of the currency and no larger than a jockey in fair training. There was only one section left on the crowded train that brought them home from New York and they tossed a coin for the lower berth. Little Jim won; and big Sam, with the power of two porters, was hoisted into the upper.

A stoutish and middle-aged woman entered the car at Buffalo, and the sleepless Sam heard her tell the porter that she would stand up all night rather than wait for a later train. Sam projected his head through the green curtains and addressed her politely and sympathetically. She looked like a mother, Sam said; and she admitted she was the mother of

six. "I'm a father myself," said Sam, "my youngest son is sleeping in the lower berth. He's only a little fellow . . . and if you wouldn't mind piling in with him?"

"Not at all, and thank you for your kindness!" And the good woman straightway sat down on the edge of the berth, and presently Sam heard her shoes drop and herself roll in beside the sleeping Jim. He heard Jim's head hit the bottom of the upper berth as he jumped from his sleep, crying, "What the hell?" He heard the woman speak soothingly, "Sssh, my little man, your father said—" Sam heard Jim's "Get to the devil out of here!" and his unrepeatable opinion of him that had been called his father. And then Sam rolled over as best could a man of his size in an upper berth, and was strangely happy.

The Locomotive and Jabez

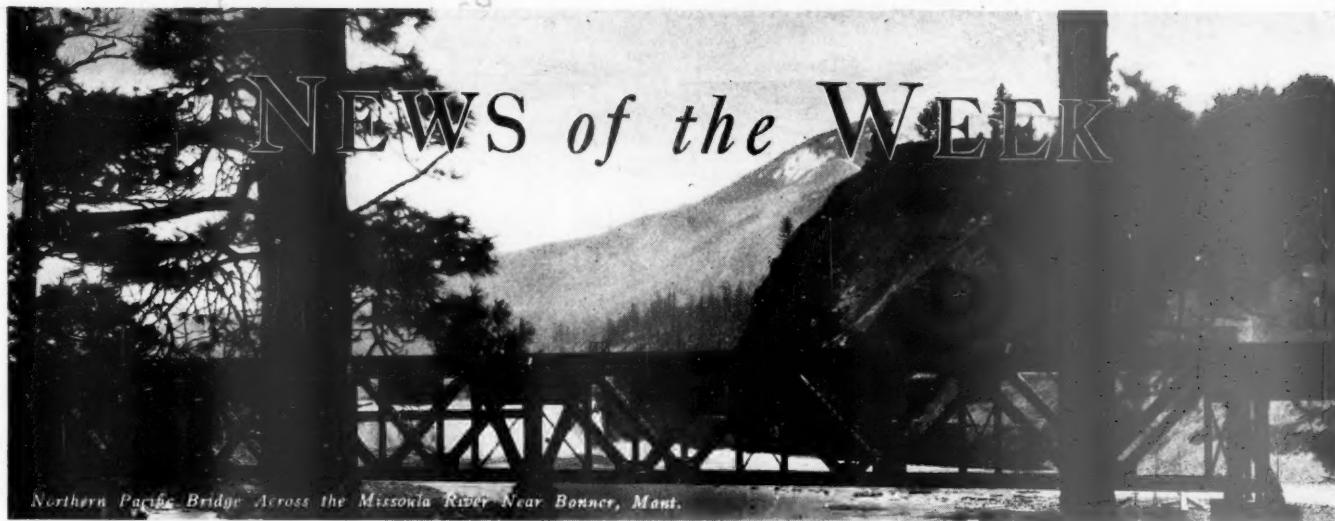
It was the morn of the glorious Fourth of July, in Atlanta. Jabez E. Scott of that city wanted to go to Birmingham to celebrate the holiday fittingly, or rather to continue to celebrate, for, as will develop later, for Jabez the celebration was well on its way. Sauntering about, Jabez encountered a Southern locomotive. Both Jabez and the locomotive were steamed up, and, with such a combination, practically anything may happen. What happened in this instance was that Jabez climbed aboard, opened the throttle and headed for points West. The expedition, which might otherwise have made history, came to an abrupt halt by means of the automatic train control. But for that, Jabez announced ruefully, he might even now be pulling into the Golden Gate, or perhaps the Pearly Gate, who knows? Yes, there is a sequel. The judge fined Jabez \$50 and placed him on probation for a year.

He Grew Up With the Motive Power

Jammed into the span of life of William Kelly, superintendent of motive power of the Great Northern, is the unique experience of having pulled the throttle of the first locomotive ever operated in the Northwest and of having designed a modern passenger locomotive. As an engineman in the late eighties Mr. Kelly sat in the cab of the William Crooks, No. 1 of the Great Northern's motive power, pulling James J. Hill's special over various parts of the railway magnate's rapidly expanding system. Recently, Mr. Kelly supervised the placing in service of 14 new 4-8-4 type locomotives which will be used on the railroad's transcontinental passenger trains.



William Kelly (Left) and C. O. Jenks, Operating Vice-President of the Great Northern, Standing in Front of the William Crooks and a 4-8-4 Type Locomotive



Northern Pacific Bridge Across the Missoula River Near Bonner, Mont.

THE CHICAGO, BURLINGTON & QUINCY veterans' association will hold its eleventh annual convention in Denver, Colo., on September 13 and 14.

JOHN E. CURTISS, chairman of the Nebraska State Railway Commission, has resigned, effective September 1, to become an industrial director and general manager for the Iowa-Nebraska Power & Light Company, at Lincoln, Neb.

THE SOUTHERN & SOUTHWESTERN RAILWAY CLUB will hold its next meeting at Ansley Hotel, Atlanta, Ga., on September 18, at 10 a.m. Robert Scott, director of Safety of the Atlantic Coast Line, will speak on prevention of personal injuries, and a representative of the Republic Steel Corporation will show a motion picture illustrating the manufacture of steel.

THE PACIFIC ELECTRIC, THE UNION PACIFIC AND THE FLOOD CONTROL COMMITTEE in Los Angeles, Cal., have made arrangements for placing flat cars loaded with rock at strategic locations for repair work during periods of high water. The Railroad Commission of California has approved connections between the tracks of the railroads and those of the flood control districts laid along the levees.

PASSENGERS TRAVELING BY AIRPLANE incur a hazard 22 times greater than when traveling by railroad. This is the calculation of the Actuarial Society of America as told in a press dispatch from Hartford, Conn. The number of airplane passengers killed is said to be one in every five thousand, the figures being based on a survey covering scheduled air lines from January 1, 1927, to April 1, 1930.

MELFORD J. FREEBURG, a pilot on the Chicago-St. Paul air mail route, was presented a gold watch on August 18 by W. F. Thiehoff, general manager of the Chicago, Burlington & Quincy, for "resourcefulness in preventing the wreck of a passenger train on the La Crosse division of that railroad, on July 12. The pilot was flying south at midnight when he observed the train approaching a burning bridge over the Chippewa river at Trevino, Wis. He played his landing light on the locomotive to attract the

attention of the engineman who stopped the train a few hundred yards from the bridge.

C. P. R. Speeds Construction as Drought Relief

Anticipating its construction program by almost two years to aid farmers in the drought-affected area of south Saskatchewan, the Canadian Pacific will proceed at once with grading work on a projected line from Vanguard southerly to a point of junction on the Lethbridge-Weyburn branch, it was announced in Winnipeg last week by D. C. Coleman, vice-president, western lines.

The Vanguard-Meyronne extension will form a continuation of a southerly branch line which taps the main line of the Canadian Pacific at Swift Current, the section of new grading being about 35 miles in length.

Kentucky Rates to be Investigated

The Kentucky Railroad Commission has ordered an investigation of all intrastate freight rates and has directed all railroads operating within the state to be represented at Louisville on October 1 for interrogation. The investigation will be made under an act of the 1930 general assembly which empowered this commission to conduct such investigations without the filing of complaints. The commission charges that in many instances intrastate rates are higher for shorter than for longer distances and that rates on the same commodities are not uniform throughout the state; and that rates in Kentucky are higher than in Illinois, Indiana, Ohio, West Virginia and the northern part of Virginia.

"Your Accident Rate is High"

The admonition "Your Accident Rate is High" is the salient feature of the poster, No. 87, which has been issued by the Safety Section of the American Railway Association, for special attention of safety departments in their activities during the month of September. This poster, addressed particularly to workmen in the bridge and building department, is the only document issued for attention in

September, the committee on education having decided that the recent committee report, on the elimination of accidents to bridge and building men, issued by the American Bridge & Building Association, will afford all needed comment on the picture, and information as to what it means.

The exhortation to reduce the accident rate is based on the statement that in 1929 the number of workmen killed in this department was 45, and the number injured 2,254. These totals include carpenters, painters, iron workers, masons, brick layers, plumbers, etc.

Copies of the report referred to may be obtained from C. A. Lichy, secretary, 319 North Waller Avenue, Austin Station, Chicago.

Analysis of Wage Changes

Hourly earnings of all wage earners on Class I railroads in the United States averaged slightly over 64 cents in the fourth quarter of 1929 while average weekly earnings were \$31.80, according to a study entitled "Wages in the United States 1914-1929" recently completed by the National Industrial Conference Board, New York.

According to the Conference Board study, average earnings per hour of all train and engine service labor amounted to 92 cents, and weekly earnings, to \$48.13; skilled shop labor received slightly less than 80 cents per hour and \$37.62 per week. Earnings of unskilled shop labor were nearly 38 cents per hour and \$17.97 per week. Of the individual occupation of the train and engine service group for which the Conference Board computed figures, the highest average hourly earnings, about \$1.59, were received by road passenger enginemen; their average weekly earnings were \$66.15. The smallest hourly earnings, a little over 72 cents, were recorded for road freight brakemen, and the lowest weekly earnings, \$38.34, for yard firemen.

"With reference to the trend of earnings since 1914-1915," states the Conference Board report, "it will be noted that average hourly earnings reached their maximum in 1920, when they were 159 per cent above 1914-1915. In 1921 they

(Continued on page 382)

August 23, 1930

Operating Statistics of Large Steam Railways — Selected Items for June, 1930, Comp

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)			Average number of locomotives on line			
			Principal and helper	Light	Loaded (thous-ands)	Per cent loaded	Gross, Excluding locomotives and tenders	Net. Revenue and non-revenue	Serv-iceable	Un-serv-iceable	Per cent unserv-iceable	Stored	
New England Region:													
Boston & Albany.....1930	407	151,854	162,283	16,845	4,284	65.1	227,118	79,174	104	23	18.3	49	
1929	407	199,071	210,465	20,465	5,089	67.6	261,472	95,876	99	24	19.5	41	
Boston & Maine.....1930	2,066	334,073	380,318	50,316	11,184	69.6	575,275	219,035	239	53	18.3	64	
1929	2,059	373,591	434,309	55,079	13,017	71.2	642,753	249,534	250	33	11.5	53	
N. Y., New H. & Hart.....1930	2,104	431,934	497,326	29,427	14,263	63.2	784,772	294,479	270	69	20.4	36	
1929	2,103	492,782	565,237	42,124	16,305	66.6	856,857	330,101	281	69	19.6	14	
Great Lakes Region:													
Delaware & Hudson.....1930	875	286,119	371,719	36,781	9,097	61.8	560,183	253,981	238	31	11.6	106	
1929	875	320,153	428,187	46,508	10,295	62.4	618,220	286,705	243	28	10.3	83	
Del., Lack. & Western.....1930	998	426,956	470,338	53,423	14,430	66.1	825,926	335,419	232	56	19.5	42	
1929	998	488,036	541,194	61,539	17,493	67.5	967,350	395,688	242	58	19.5	24	
Erie (inc. Chi. & Erie).....1930	2,316	787,451	843,784	63,173	34,442	60.8	2,108,223	806,523	410	89	17.8	90	
1929	2,316	862,076	922,479	64,682	38,927	64.0	2,287,209	921,647	383	106	21.6	26	
Grand Trunk Western.....1930	1,020	264,884	269,082	3,624	7,353	62.4	424,628	152,257	95	29	23.5	24	
1929	992	371,964	373,490	1,674	11,122	66.2	616,491	233,074	118	24	17.0	..	
Lehigh Valley.....1930	1,343	465,188	501,938	51,250	14,694	64.5	898,362	390,599	259	81	23.9	25	
1929	1,343	528,738	578,523	63,383	17,535	65.1	1,042,295	451,960	282	84	22.9	52	
Michigan Central.....1930	1,865	429,718	430,819	14,575	14,350	59.2	843,807	288,647	166	49	22.7	44	
1929	1,822	548,409	549,456	17,472	19,893	61.2	1,111,065	386,484	193	37	16.2	17	
New York Central.....1930	6,468	1,739,904	1,904,125	131,154	67,000	61.2	4,137,375	1,738,445	1,029	335	24.5	371	
1929	6,467	1,990,934	2,189,525	159,500	79,631	61.5	4,773,269	2,016,323	985	345	26.0	192	
New York, Chi. & St. L. ....1930	1,665	543,238	570,146	6,386	17,646	60.0	1,037,605	365,822	204	58	22.2	53	
1929	1,665	659,754	670,579	6,016	21,851	63.2	1,230,065	455,270	199	65	24.7	27	
Pere Marquette.....1930	2,177	363,949	369,730	4,464	8,908	60.5	558,456	226,994	169	22	11.7	39	
1929	2,178	459,854	464,920	5,463	12,056	62.9	713,605	303,577	181	32	15.0	4	
Pitts. & Lake Erie.....1930	231	113,828	115,896	1,766	4,355	64.1	348,585	203,717	55	15	20.7	24	
1929	231	136,284	137,387	1,806	5,014	63.8	386,074	222,803	52	12	18.9	11	
Wabash.....1930	2,497	663,966	704,311	10,347	21,107	62.6	1,219,985	424,105	297	78	20.7	59	
1929	2,497	842,944	876,026	13,889	25,931	64.7	1,463,227	543,767	287	68	19.2	17	
Central Eastern Region:													
Baltimore & Ohio.....1930	5,541	1,503,551	1,736,846	223,643	49,984	61.4	3,370,284	1,542,826	1,001	182	15.4	275	
1929	5,536	1,989,702	2,251,066	259,035	60,460	62.1	4,014,764	1,880,248	1,010	186	15.6	94	
Big Four Lines.....1930	2,712	704,839	733,064	16,084	21,481	61.8	1,359,375	610,207	299	159	34.8	41	
1929	2,717	805,998	836,303	21,450	26,463	60.8	1,699,818	762,807	342	129	27.4	28	
Central of New Jersey.....1930	692	244,187	265,886	41,237	6,859	57.3	462,135	207,252	161	32	16.5	25	
1929	691	255,852	276,337	45,941	7,419	58.7	490,831	222,064	174	34	16.1	31	
Chicago & Eastern Ill. ....1930	946	205,399	205,522	2,219	5,468	62.7	328,502	135,548	99	53	34.8	39	
1929	946	237,927	238,693	2,518	6,825	66.1	391,177	166,645	90	73	44.9	24	
Elgin, Joliet & Eastern ..1930	453	118,419	125,592	4,669	3,285	62.5	250,644	129,941	72	16	18.1	3	
1929	453	143,726	151,535	6,179	4,140	63.7	310,631	165,600	78	10	11.4	1	
Long Island.....1930	400	42,951	47,194	10,979	491	53.1	34,577	13,608	36	9	20.6	1	
1929	400	49,344	53,969	14,448	575	53.5	38,761	14,876	37	5	11.0	..	
Pennsylvania System.....1930	10,687	3,505,436	4,009,212	388,691	126,762	61.6	8,481,414	3,747,864	2,439	291	10.7	677	
1929	10,738	4,109,819	4,729,090	435,265	151,895	64.0	10,040,497	4,668,830	2,654	254	8.7	576	
Reading.....1930	1,454	566,306	613,777	53,265	15,444	58.0	58.0	1,125,719	533,138	314	59	15.9	53
1929	1,451	569,582	630,676	49,358	17,112	61.4	1,149,646	557,676	334	58	14.8	59	
Pocahontas Region:													
Chesapeake & Ohio.....1930	3,085	1,083,008	1,150,550	49,817	40,663	55.5	3,345,008	1,780,439	534	107	16.7	101	
1929	3,077	1,194,732	1,282,116	53,519	44,500	56.9	3,586,591	1,949,376	586	111	14.9	83	
Norfolk & Western.....1930	2,230	768,141	854,712	41,778	29,121	58.6	2,371,325	1,234,426	454	50	9.9	123	
1929	2,230	874,777	986,030	36,912	34,138	58.5	2,830,649	1,508,497	468	52	10.0	95	
Southern Region:													
Atlantic Coast Line.....1930	5,155	627,152	629,926	8,828	15,785	60.4	867,833	298,449	379	70	15.6	96	
1929	5,153	693,732	698,432	8,897	19,342	59.7	1,064,687	375,632	415	58	12.2	85	
Central of Georgia.....1930	1,900	262,203	265,539	4,114	5,980	65.7	325,793	123,875	125	23	15.3	1	
1929	1,900	292,341	295,195	5,184	7,272	70.6	373,864	151,463	137	13	8.9	2	
Ill. Cent. (inc. Y. & M. V.).....1930	6,695	1,665,616	1,680,743	29,254	44,310	60.8	2,877,434	1,120,249	721	126	14.9	65	
1929	6,710	1,937,171	1,950,261	30,880	54,002	63.0	3,391,127	1,363,348	737	116	13.6	22	
Louisville & Nashville.....1930	5,244	1,382,180	1,463,346	42,126	29,598	58.1	2,044,832	934,730	568	132	18.8	93	
1929	5,247	1,596,125	1,669,814	56,988	36,305	60.7	2,429,575	1,144,626	588	107	15.4	51	
Seaboard Air Line.....1930	4,479	509,081	525,370	5,583	12,496	63.4	700,142	262,845	273	32	10.5	16	
1929	4,475	531,147	551,023	7,989	13,715	65.2	752,946	290,791	266	41	13.4	6	
Southern.....1930	6,676	1,266,631	1,291,211	23,555	30,470	63.4	1,720,140	656,438	807	152	15.8	202	
1929	6,679	1,429,345	1,456,076	28,866	36,356	65.0	1,993,941	788,450	829	125	13.1	145	
Northwestern Region:													
Chi. & North Western.....1930	8,459	1,195,780	1,248,662	21,384	31,491	62.3	1,875,835	708,570	757	88	10.5	138	
1929	8,467	1,383,122	1,438,530	22,024	37,331	63.2	2,224,549	879,167	729	96	11.6	80	
Chi. Gt. Western.....1930	1,459	254,894	272,304	20,946	7,929	62.8	455,854	172,166	114	10	8.8	12	
1929	1,459	266,042	309,180	19,242	8,504	64.0	489,493	186,001	140	20	14.4	25	
Chi., Milw., St. P. & Pac. ....1930	11,313	1,440,426	1,530,295	79,286	41,465	62.3	2,517,356	1,019,997	801	138	14.7	251	
1929	11,244	1,647,913	1,764,204	103,208	51,591	63.1	3,060,708	1,275,060	777	135	14.8	162	
Chi., St. P., Minn. & Om. ....1930	1,724	267,834	289,023	12,154	5,783	66.8	324,737	133,772					

ared with June, 1929, for Roads with Annual Operating Revenue Above \$25,000,000

Region, road and year	Average number of freight cars on line			Gross ton- miles per train	Gross ton-miles per train-mile	Net ton- miles per train excluding locomo- tives and tenders	Net ton- miles per train including locomo- tives and tenders	Net ton- miles per car mile	Car- miles per car- day	ton- miles per car day	Pounds of coal per 1,000 gross ton-miles per car day	Loco- motive- miles per car day	
	Home	Foreign	Total	Per cent hour, un- serv- icing tenders	Per cent hour, clud- ing locomo- tives and tenders	Per train- mile	Per train- mile	Per car- mile	Per car- day	Per car- day	Per car- day	Per car- day	
New England Region:													
Boston & Albany.....	3,708	3,623	7,331	8.5	20,823	1,496	521	18.5	360	29.9	6,483	144	47.0
1929	3,288	5,241	8,529	9.9	18,967	1,314	482	18.8	375	29.4	7,850	157	62.8
Boston & Maine.....	9,735	11,512	21,247	5.8	20,914	1,722	656	19.6	344	25.2	3,534	104	49.2
1929	9,862	12,326	22,188	5.1	20,894	1,720	668	19.2	375	27.5	4,039	106	57.7
N. Y., New H. & Hart.....	17,899	13,511	31,410	13.5	24,040	1,817	682	20.6	313	23.9	4,664	101	51.8
1929	15,469	15,763	31,232	8.3	22,204	1,739	670	20.2	352	26.1	5,232	99	58.0
Great Lakes Region:													
Delaware & Hudson.....	10,403	4,892	15,295	4.2	25,614	1,958	888	27.9	554	32.1	9,673	117	50.7
1929	9,458	6,249	15,707	4.2	24,756	1,931	896	27.8	608	35.0	10,922	119	58.4
Del., Lack. & Western.....	18,775	5,687	24,462	5.1	25,477	1,934	786	23.2	457	29.7	11,201	124	60.6
1929	16,863	7,928	24,791	4.0	25,364	1,982	811	22.6	532	34.9	13,214	120	66.9
Erie (inc. Chi. & Erie).....	35,650	15,722	51,372	4.1	38,000	2,677	1,024	23.4	523	36.8	11,608	101	60.7
1929	29,666	19,848	49,514	4.5	34,638	2,653	1,069	23.7	620	40.9	13,264	103	67.3
Grand Trunk Western.....	4,307	10,373	14,680	6.4	23,738	1,603	575	20.7	346	26.8	4,977	98	73.5
1929	3,110	15,839	18,949	4.9	22,301	1,657	627	21.0	410	29.6	7,836	95	87.7
Lehigh Valley	20,229	7,523	27,752	8.1	28,507	1,931	840	26.6	469	27.4	9,696	135	54.3
1929	20,813	9,211	30,024	9.6	28,290	1,971	855	25.8	502	29.9	11,214	138	58.5
Michigan Central.....	24,127	14,048	38,175	5.0	33,978	1,964	672	20.1	252	21.2	5,158	100	69.1
1929	18,262	17,400	35,662	5.2	32,751	2,026	705	19.4	361	30.4	7,071	101	82.2
New York Central.....	75,730	66,310	142,040	5.0	33,126	2,378	999	25.9	408	25.7	8,960	95	49.8
1929	69,020	82,876	151,896	4.5	32,975	2,398	1,013	25.3	442	28.2	10,393	96	58.8
New York, Chi. & St. L.	15,601	8,799	24,400	8.2	29,665	1,10	673	20.7	500	40.2	7,325	93	73.3
1929	13,284	11,609	24,893	6.3	27,458	1,864	690	20.8	610	46.3	9,116	97	85.4
Pere Marquette	9,317	6,365	15,682	3.7	22,407	1,534	624	25.5	482	31.3	3,476	93	65.2
1929	10,205	9,730	19,935	3.2	20,591	1,552	660	25.2	508	32.1	4,647	95	73.8
Pitts. & Lake Erie.....	15,926	2,215	18,141	6.6	40,571	3,062	1,790	46.8	374	12.5	29,370	87	56.1
1929	11,792	10,004	21,796	6.1	34,529	2,833	1,635	44.4	341	12.0	32,113	98	72.6
Wabash	18,525	10,400	28,925	3.1	31,292	1,837	639	20.1	489	38.9	5,662	106	63.7
1929	14,924	12,996	27,920	2.4	29,297	1,736	645	21.0	649	47.8	7,260	108	83.5
Central Eastern Region:													
Baltimore & Ohio.....	79,230	24,260	103,490	4.9	26,438	2,242	1,026	30.9	497	26.2	9,282	129	55.2
1929	71,362	31,770	103,132	6.9	23,629	2,018	945	31.1	608	31.5	11,321	133	70.0
Big Four Lines	25,634	21,190	46,824	4.2	30,218	1,929	866	28.4	434	24.7	7,501	107	54.5
1929	22,286	22,797	45,083	4.9	29,581	2,109	946	28.8	564	32.3	9,357	104	60.7
Central of New Jersey.....	17,741	9,121	26,862	5.4	24,454	1,893	849	30.2	257	14.9	9,979	137	53.1
1929	17,044	10,778	27,822	6.1	23,138	1,918	868	29.9	266	15.1	10,719	139	51.7
Chicago & Eastern Ill.....	13,262	3,345	16,607	4.6	27,701	1,599	660	24.8	272	17.5	4,775	111	45.6
1929	13,021	4,149	17,170	40.2	25,442	1,644	700	24.4	324	20.0	5,870	116	49.2
Elgin, Joliet & Eastern.....	9,771	6,251	16,022	4.8	15,895	2,117	1,097	39.6	270	10.9	9,565	104	49.3
1929	8,828	8,116	16,944	5.5	16,132	2,161	1,152	40.0	326	12.8	12,179	120	59.7
Long Island	770	4,511	5,281	1.5	6,219	805	317	27.7	86	5.8	1,133	325	43.0
1929	992	4,398	5,390	2.0	5,915	786	301	25.9	92	6.6	1,239	319	55.6
Pennsylvania System.....	232,505	72,515	305,020	3.8	31,084	2,420	1,069	29.6	410	22.5	11,690	113	53.7
1929	214,086	91,218	303,304	5.3	29,381	2,443	1,136	30.7	510	25.9	14,493	114	59.2
Reading	32,940	11,076	44,016	5.0	23,089	1,988	941	34.5	404	20.2	12,225	132	59.6
1929	28,770	14,361	43,131	5.1	21,851	2,018	979	32.6	431	21.5	12,808	137	57.8
Pocahontas Region:													
Chesapeake & Ohio.....	43,574	10,862	54,436	2.4	41,250	3,089	1,644	43.8	1,090	44.9	19,240	78	62.4
1929	35,611	14,151	49,762	2.6	38,322	3,002	1,632	43.8	1,306	52.4	21,116	80	63.9
Norfolk & Western.....	34,733	7,584	42,317	1.2	43,712	3,087	1,607	42.4	972	39.1	18,452	108	59.4
1929	28,597	8,899	37,496	1.5	45,559	3,236	1,724	44.2	1,341	51.9	22,548	111	65.6
Southern Region:													
Atlantic Coast Line.....	23,020	6,020	29,040	5.7	21,003	1,384	476	18.9	343	30.0	1,930	100	47.5
1929	19,776	8,703	28,479	6.3	22,738	1,535	541	19.4	440	37.9	2,430	99	49.9
Central of Georgia.....	6,443	3,810	10,253	8.0	18,936	1,254	472	20.7	403	29.6	2,174	125	60.7
1929	4,536	5,368	9,904	5.1	19,174	1,296	518	20.8	510	34.7	2,657	128	66.8
Ill. Cent. (inc. Y. & M. V.).....	48,146	17,238	65,384	4.8	25,518	1,728	673	25.3	571	37.1	5,578	119	67.3
1929	39,963	20,607	60,570	5.2	25,699	1,751	704	25.2	750	47.1	6,772	117	77.4
Louisville & Nashville.....	48,825	10,630	59,455	9.3	21,960	1,497	678	31.7	526	28.5	5,959	130	71.6
1929	44,775	15,059	59,834	9.6	20,770	1,522	717	31.5	638	33.3	7,272	131	82.8
Seaboard Air Line.....	14,629	5,570	20,199	3.4	19,233	1,375	516	21.0	434	32.5	1,956	121	58.0
1929	13,523	7,485	21,008	6.9	19,070	1,418	547	21.2	461	33.4	2,166	123	60.8
Southern	53,918	13,026	66,944	12.4	20,670	1,358	518	21.5	327	23.9	3,278	143	45.7
1929	47,715	16,276	63,991	9.9	20,797	1,395	552	21.7	411	29.2	3,935	145	51.9
Northwestern Region:													
Chi. & North Western.....	50,125	22,469	72,594	7.8	20,757	1,569	593	22.5	325	23.2	2,792	118	50.0
1929	47,219	27,348	74,567	7.0	20,741	1,608	636	23.5	393	26.4	3,461	118	59.0
Chi. Gt. Western.....	4,213	3,864	8,077	4.9	26,345	1,788	675	21.7	711	52.1	3,933	122	85.7
1929	5,410	4,541	9,951	7.3	25,439	1,840	699	21.9	623	44.5	4,249	127	78.0

News of the Week

(Continued from page 397)

declined slightly, and in the following year, more markedly. Since 1923 there has been an upward movement accompanied by fluctuations, so that by 1929 earnings were again close to the 1920 level. In the last quarter of 1929 average

hourly earnings were 154 per cent above 1914-1915. The development of average weekly earnings has been similar to that of average hourly earnings, except that the maximum earnings in 1920 were only 125 per cent higher than in 1914-1915; after 1920 the reduction was somewhat more gradual than in the case of hourly earnings, and the subsequent low point was not reached until 1924. In the last

quarter of 1929, average weekly earnings were 110 per cent above 1914-1915 and, therefore, not quite so close to the 1920 level as hourly earnings.

"Of the three groups, all train and engine service labor, skilled shop labor, and unskilled labor, the last mentioned showed the largest relative increases up to 1920. At that time the average earnings of unskilled labor per hour were 193

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 172 Steam Railways, Including 16 Switching and Terminal Companies.

FOR THE MONTH OF JUNE, 1930 AND 1929

Item	United States		Eastern District		Southern District		Western District	
	1930	1929	1930	1929	1930	1929	1930	1929
Average number of miles operated	242,409.50	242,445.69	60,244.86	60,099.45	46,113.67	46,138.12	136,050.97	136,208.12
Revenues:								
Freight	\$331,647,243	\$391,140,007	\$143,652,539	\$173,197,475	\$59,207,003	\$69,303,734	\$128,787,701	\$148,638,798
Passenger	a 67,145,725	b 79,344,015	37,025,436	41,895,128	7,558,756	9,657,615	22,561,533	27,791,272
Mail	9,089,048	c 19,170,954	3,436,439	4,497,780	1,487,169	3,946,880	4,165,440	8,726,294
Express	10,389,306	11,517,410	4,856,851	4,819,539	1,325,511	1,712,339	4,206,944	4,985,532
All other transportation	15,232,921	18,394,142	9,108,678	10,899,165	961,684	1,236,158	5,162,559	6,208,819
Incidental	10,587,422	12,320,018	5,505,564	6,008,669	1,225,381	1,291,366	3,856,477	5,019,983
Joint facility—Cr.	1,082,457	1,093,023	344,577	371,403	226,012	161,081	511,868	560,539
Joint facility—Dr.	325,635	358,541	82,942	75,369	41,683	33,492	201,010	249,680
Railway operating revenues	444,848,487	532,621,028	203,847,142	243,613,790	71,949,833	87,325,681	169,051,512	201,681,557
Expenses:								
Maintenance of way and structures	66,807,313	79,708,189	28,246,740	32,611,243	10,724,336	12,809,627	27,836,237	34,287,319
Maintenance of equipment	85,361,816	100,766,141	39,652,647	47,680,828	15,266,828	18,336,484	30,442,341	34,748,829
Traffic	11,407,233	11,538,873	4,263,986	4,366,251	2,007,415	2,003,851	5,135,832	5,168,771
Transportation	151,380,690	169,655,383	71,741,529	80,808,692	24,114,520	26,576,359	55,524,641	62,270,332
Miscellaneous operations	4,509,164	5,229,655	2,142,621	2,291,545	451,301	465,273	1,915,242	2,472,837
General	16,303,658	16,614,295	7,239,419	7,371,546	2,793,808	2,782,018	6,270,431	6,460,731
Transportation for investment—Cr.	1,131,942	1,157,867	264,867	311,211	92,519	d 1,084	774,556	847,740
Railway operating expenses	334,637,932	382,354,669	153,022,075	174,818,894	55,265,689	62,974,696	126,350,168	144,561,079
Net revenue from railway operations	110,210,555	150,266,359	50,825,067	68,794,896	16,684,144	24,350,985	42,701,344	57,120,478
Railway tax accruals	31,377,695	34,284,389	13,672,738	14,535,002	5,508,324	6,117,341	12,196,633	13,632,046
Uncollectible ry. revenues	68,476	85,816	25,036	27,640	14,020	25,533	29,420	32,643
Railway operating income	78,764,384	115,896,154	37,127,293	54,232,254	11,161,800	18,208,111	30,475,291	43,455,789
Equipment rents—Dr. balance	7,941,665	7,872,011	4,204,920	4,480,751	110,658	d 315,415	3,626,087	3,706,675
Joint facility rent—Dr. balance	1,939,244	2,206,335	791,100	1,063,989	330,584	254,716	817,560	887,630
Net railway operating income	68,883,475	105,817,808	32,131,273	48,687,514	10,720,558	18,268,810	26,031,644	38,861,484
Ratio of expenses to revenues (per cent)	75.23	71.79	75.07	71.76	76.81	72.11	74.74	71.68
FOR SIX MONTHS ENDED WITH JUNE, 1930 AND 1929								
Average number of miles operated	242,485.19	242,335.91	60,275.86	60,116.09	46,114.09	46,111.03	136,095.24	136,108.79
Revenues:								
Freight	\$2,042,399,441	\$2,323,106,023	\$893,401,191	\$1,023,118,547	\$387,072,933	\$432,769,487	\$761,925,317	\$867,217,989
Passenger	e 380,647,331	f 431,074,863	205,771,612	224,954,228	54,622,707	64,136,377	120,253,012	141,984,258
Mail	55,489,779	g 69,837,635	21,128,246	26,176,102	9,332,003	12,010,277	25,029,530	31,651,256
Express	60,932,246	71,861,517	27,571,416	32,633,389	9,615,681	12,066,938	23,745,149	27,161,190
All other transportation	89,752,848	104,197,721	52,114,439	59,520,417	6,994,810	7,941,588	30,643,599	36,735,716
Incidental	57,641,288	63,448,996	30,105,713	32,454,551	8,381,997	8,718,606	19,153,578	22,275,839
Joint facility—Cr.	6,609,332	6,260,660	2,180,507	2,107,286	1,209,684	947,347	3,219,141	3,206,027
Joint facility—Dr.	2,007,367	1,968,744	598,956	486,068	205,925	206,722	1,202,486	1,275,954
Railway operating revenues	2,691,464,898	3,067,818,671	1,231,674,168	1,400,478,452	477,023,890	538,383,898	982,766,840	1,128,956,321
Expenses:								
Maintenance of way and structures	375,575,075	414,311,013	154,563,420	168,963,604	68,802,905	76,609,039	152,208,750	168,738,370
Maintenance of equipment	546,090,553	603,469,873	253,591,392	286,421,796	98,796,228	106,678,284	193,702,933	210,369,793
Traffic	66,677,366	64,649,099	25,443,387	24,179,179	12,303,432	12,123,162	28,930,547	28,346,758
Transportation	965,222,081	1,046,759,503	456,355,781	493,710,974	157,312,922	170,105,111	351,563,378	382,943,418
Miscellaneous operations	27,307,918	28,697,492	12,998,902	13,210,880	3,575,248	3,564,661	10,733,768	11,921,951
General	98,661,060	97,301,230	43,256,153	42,131,214	16,637,417	16,617,930	38,767,490	38,552,086
Transportation for investment—Cr.	6,290,583	5,702,066	1,243,855	1,268,654	585,612	406,914	4,461,116	4,026,498
Railway operating expenses	2,073,253,470	2,249,486,144	944,965,180	1,027,348,993	356,842,540	385,291,273	771,445,750	836,845,878
Net revenue from railway operations	618,211,428	818,332,527	286,708,988	373,129,459	120,181,350	153,092,625	211,321,090	292,110,443
Railway tax accruals	181,245,807	197,041,738	75,050,373	81,928,731	35,211,323	37,384,823	70,984,111	77,728,184
Uncollectible ry. revenues	514,864	580,256	213,867	227,710	86,569	128,326	214,428	224,220
Railway operating income	436,450,757	620,710,533	211,444,748	290,973,018	84,883,458	115,579,476	140,122,551	214,158,039
Equipment rents—Dr. balance	47,356,402	45,726,437	24,341,200	24,918,979	1,730,011	1,219,552	21,285,191	19,587,906
Joint facility rent—Dr. balance	12,665,516	12,254,362	6,188,322	6,052,346	1,400,444	1,137,775	5,076,750	5,064,241
Net railway operating income	376,428,839	562,729,734	180,915,226	260,001,693	81,753,003	113,222,149	113,760,610	189,505,892
Ratio of expenses to revenues (per cent)	77.03	73.33	76.72	73.36	74.81	71.56	78.50	74.13

^a Includes \$3,266,157 sleeping and parlor car surcharge. ^b Includes \$3,691,664 sleeping and parlor car surcharge. ^c Includes approximately \$9,966,128 back mail pay. ^d Deficit or other reverse items. ^e Includes \$18,494,139 sleeping and parlor car surcharge. ^f Includes \$20,018,678 sleeping and parlor car surcharge. ^g Includes approximately \$14,309,404 back mail pay.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

per cent, and per week, 151 per cent above 1914-1915. The advances in the earnings of the skilled shop labor group followed fairly closely with increases of 176 per cent and 143 per cent respectively, above 1914-1915, while the earnings of train and engine service labor had risen 102 per cent and 90 per cent respectively. By the end of 1929, however, the earnings of skilled shop labor had advanced relatively higher over the 1914-1915 level than those of any other group; per hour they were 168 per cent, and per week, 123 per cent above 1914-1915, while those of unskilled labor had risen 135 per cent and 91 per cent, respectively, and those of all train and engine service labor, 115 per cent and 89 per cent respectively."

Among the individual occupations, the earnings of yard firemen at the end of 1929 had risen higher above their 1914-1915 level than those of any other group. In the case of hourly earnings, the rise amounted to 197 per cent, and for weekly earnings, 118 per cent. The smallest rise in hourly earnings over 1914-1915 was that of road freight conductors, which was 82 per cent, and in weekly earnings, of road passenger enginemen, 59 per cent."

Taking into account changes in the cost of living, in order to arrive at the "real earnings" of railroad workers, the Conference Board finds that "the real average hourly earnings of railroad workers have been above the 1914-1915 level at every subsequent period for which figures have been computed except in 1916 and 1917, when they were 2 per cent and 7 per cent, respectively, below that level. The maximum in real average hourly earnings was not reached in 1920, as might be expected, but in the first two quarters of 1929, when they were 58 per cent above the 1914-1915 level. In 1920 they were 32 per cent above 1914-1915. A similar picture is presented by the figures of real average weekly earnings, although the relative increases over 1914-1915 are not so large. The maximum, 33 per cent, was attained in the second quarter of 1929. The increase amounted only to 14 per cent in 1920, but rose to 25 per cent in 1922. The relatively advantageous position in 1929 was attributable both to an increase in actual money earnings and to a slight decline in the cost of living."

Concerning hours of work, the report states that between 1914 and 1918 the average number of hours of all wage earners in the railroad industry was 60 a week. Since 1918 they have been fluctuating around 50 a week.

Grade Crossing Elimination Progress in New York

A total of 795 railroad grade crossings, included in 456 orders for elimination, have been designated for removal by the Public Service Commission of the State of New York since the passage of the present grade crossing elimination act in 1926, according to a commission report made public on August 15. In the four years that the act has been in effect, the commission has held 2,401 hearings concerning the elimination of 1,624 crossings included in 940 separate proceedings, of which 419 proceedings in-

volving 542 crossings have been closed.

The total estimated cost of eliminating the crossings which have been ordered for removal is \$180,284,185. Of the projects in which final orders have been issued, 149 projects involving 215 crossings have been approved, as completed at a cost of \$5,417,705. An additional 86 projects involving the elimination of 134 crossings are now under contract at an estimated cost of \$14,093,440, while 13 projects are ready for contracts to be awarded and 199 additional projects are ready except for settlement of final details.

During the month of July, the commission started eight new proceedings involving the elimination of 63 crossings. Two of these proceedings were closed and elimination orders were entered in three of the others. Nine projects involving the elimination of 10 crossings were completed and the work approved during the same month.

Purchases and Stores Contest

The Purchases and Stores Division of the A. R. A. has announced, through Secretary W. J. Farrell, a competition for papers on purchasing and stores activities. The contest will be conducted in the same manner as in previous years and is open to all employees of railway purchases and stores departments below the ranks of assistant purchasing agent and assistant general storekeeper. The papers may consider any subject relating to the purchasing, storing or distributing of material, and should contain between 1,000 and 3,000 words. They must be submitted not later than March 1, 1931. The papers will be judged on the basis of 50 per cent for originality of subject, ideas, conclusions and solutions of problems; 25 per cent for general interest and importance of the subject; 20 per cent for conciseness and clearness of expression, including grammatical construction; and 5 per cent for general appearance and neatness. Four type-written copies of each paper are required, which should be typed in double space on one side of the paper, using a black record ribbon, and should carry, on the first page, the subject of the paper, full name of the author, and his title, railroad and address. Two papers will be selected from the entries by a committee consisting of L. P. Krampf, supply agent, Missouri Pacific; J. E. Mahaney, general supervisor of stores, Chesapeake & Ohio; and E. F. Hasbrook, assistant purchasing agent, Chicago, Burlington & Quincy. The authors of these two papers will be invited to the annual convention of the association to present their papers. The papers are to be mailed to W. J. Farrell, secretary, Division VI, Purchases and Stores, American Railway Association, 30 Vesey street, New York.

Commercial Stocks of Coal

Commercial stocks of bituminous coal amounted to 32,200,000 tons on July 1, according to the quarterly survey just completed by the United States Bureau

of Mines. In comparison with the amount on hand at the beginning of the previous quarter this is a decrease of 900,000 tons and it is also 900,000 tons less than the quantity in storage on the same date last year.

Exports during the second quarter of 1930 averaged 322,000 tons a week as against 342,000 tons during the same period last year. The weekly rate of consumption within the United States during the second quarter amounted to 7,614,000 tons as compared with 10,432,000 tons in the previous quarter. In comparison with the same period last year the rate of home consumption plus exports shows a decrease of 1,057,000 tons per week, or 11.8 per cent.

In addition to the stocks in the hands of consumers, there were 7,883,000 tons of bituminous coal on hand on the docks of Lake Superior and Lake Michigan on July 1, as compared with 3,977,000 tons on April 1. Stocks of anthracite in retail yards on July 1 show the usual seasonal increase over the amount in storage on April 1, but are slightly less in terms of days' supply than on the corresponding date of last year.

The American Railway Association reports that on July 1, the stocks of railroad coal amounted to 5,647,000 tons. This is 750,000 tons less than on July 1, 1929, and is the smallest quantity the railroads have had in storage since the close of the great suspension in 1922. The stocks held by the railroads on comparable dates in other recent years are shown below.

July 1, 1923	10,667,000
July 1, 1924	14,924,000
July 1, 1925	10,000,000
July 1, 1926	9,398,000
July 1, 1927	17,780,000
July 1, 1928	11,765,000
July 1, 1929	6,397,000
July 1, 1930	5,647,000

THE ST. LOUIS-SAN FRANCISCO, located 195 new industries along its lines during the first seven months of 1930, of which 33 were established during July. Included in the July locations are two canning factories, eight coal and material yards, seven warehouses, 11 bulk distributing stations for petroleum products and several miscellaneous industries. The estimated annual carlot production from these industries, the value of which is about \$6,555,000, is approximately 3,600 cars.

THE SHEEP AND GOAT RAISERS' ASSOCIATION, on August 18, asked the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri Pacific, the Southern Pacific and the St. Louis-San Francisco for a 50 per cent reduction in interstate and intrastate rates on Texas sheep and lambs, to be effective from August 25 to November 1. The request set forth that severe drought exists in parts of west Texas; that prices of lambs are half what they were last year; and that because feeders do not have the money with which to buy lambs, the ranchman must ship his lambs to the feed and perhaps feed them on a share basis with the owner of the feed.

Traffic

The Missouri Pacific has inaugurated a passenger rate of \$5 between St. Louis, Mo., and Memphis, Tenn., following the action of the St. Louis-San Francisco and the Illinois Central which established a rate of \$6 in June and then reduced to \$5 in July to meet motor coach competition. The Missouri Pacific accepts these tickets in day coaches, and also in Pullman cars upon payment of the Pullman fare. The tickets are also good on a combination train and motor coach trip when a passenger wishes to transfer from a train to a coach of the Missouri Pacific Transportation Company or vice versa.

The southern states have not been affected by drought to the serious degree experienced in the central and western parts of the country and the agricultural agent of the Southern calls the attention of farmers in that region to the importance of conserving their resources with a view to being able to fill the gap occasioned by failures of crops in other states. Conditions at present favor a rapid growth of dairying and live-stock growing in the south. Farmers should purchase breeding animals and conserve the young females; cattle, and also sheep and hogs. There seems to be a prospect of raising prices a year hence. Herds should be maintained and, where possible, increased. The Central of Georgia also appeals to the farmer to take good care of his hay and fodder. In Georgia the corn crops should now be a valuable asset.

Potato Terminal Opened in Chicago

A terminal devoted to the handling of potatoes was opened in Chicago on August 18 by the Chicago Produce Terminal Company which is jointly owned by the Atchison, Topeka & Santa Fe and the Illinois Central. The opening of the \$2,200,000 facilities was celebrated with a buffet luncheon at which about 200 potato dealers were guests of the Terminal company. The terminal has a capacity of 650 cars in its delivery yard and 1,800 cars in its holding yard.

Freight Traffic for June and Six Months

The freight traffic moved by Class I railroads in June amounted to 34,419,086,000 net ton-miles, according to reports compiled by the Bureau of Railway Economics. Compared with June, 1929, this was a reduction of 6,320,948,000 net ton-miles, or 15.5 per cent, and it was a reduction of 2,887,669,000 net ton-miles, or 7.7 per cent, under June, 1928. In the Eastern district, the reduction was 16.3 per cent compared with the same month in 1929, and in the Southern district 16.8 per cent; the Western district reported 14 per cent.

The record for the first six months of 1930 was 212,251,206,000 net ton-miles, a reduction of 26,257,820,000 net ton-miles

or 11 per cent under that of the corresponding period in 1929 and of 11,699,660,000 net ton-miles, or 5.2 per cent, under that of the same period in 1928. The Eastern district reported a decrease of 10.8 per cent, the Southern district 11.4 per cent, and the Western 11.2 per cent.

The average speed of freight trains in June was 14 miles an hour, an increase of 0.1 mile above the best previous record of 13.9 miles, which was attained in May this year. It also was an increase of 0.6 mile above the average for June last year.

The average daily movement per freight car in June, 28.3 miles, compared with 32.4 miles for the same month last year and 30.3 miles in June, 1928. The average load per car in June was 26.6 tons, a decrease of 0.1 ton below the average for June, 1929, but an increase of 0.3 ton above that for June, 1928.

Paper Rates Put on Class Basis

The Interstate Commerce Commission has issued a decision on a number of complaints involving the general structure of freight rates on printing and wrapping paper, paperboard boxes, and paperboard in carloads, in central and trunk line territories and between those territories. It finds that the rates on printing and wrapping paper and paperboard boxes for the future will be unreasonable to the extent that they may exceed the sixth-class rates prescribed in the Eastern Class Rate Investigation, and that the rates on paperboard will be unreasonable to the extent that they may exceed 25 per cent of the first-class rates.

Western Roads Ask Postponement of Grain Rate Revision

Western railways have petitioned the Interstate Commerce Commission for a postponement from October 1 to January 1 of the effective date of its recent order prescribing a general revision of western grain rates. The petition referred to a petition for a rehearing and reconsideration to be filed presently but said that wholly aside from the question of whether or not the order should be vacated and set aside it would be impossible to revise the tariffs and meet the requirements of the order within the time allowed. It was recognized at the outset, the roads say, that the decision would require a complete overhauling of the entire grain rate and transit structure which had been built up over a long period and that in addition to the great amount of detail work there are some parts of the order that are not entirely clear. "The order apparently requires the establishment of joint rates between points from and to which joint rates have not previously been published as through rates on the basis of the so-called interior scales. To permit determination of the rates under these so-called interior scales will require the calculation of innumerable mileages which will take considerable time to prepare under the formula prescribed by the order and publication of additional tariffs will be necessary. It is estimated that there will be a substantial increase in tariff matter as compared with that which is published today."

Foreign

South African Railway Results, 1928-1929

The report of the Railways and Harbors administration of the Union of South Africa for the fiscal year ending March 31, 1929, shows net income for the railways, of £766,527, equivalent to \$3,725,321, after depreciation and interest charges, as compared with a net surplus of £379,814, or \$1,845,896, for 1927-1928. This increase of £386,713 (\$1,879,425) was accompanied by a gain of £687,235, or \$3,339,962, in net railway operating income, due to the fact that an increase in traffic, resulting in a gain of nearly \$4,000,000 in gross revenues, was handled with an increase of less than \$500,000 in operating expenses, as shown in the following table:

	1929	1928
Operating revenues....	\$126,800,860	\$122,981,430
Operating expenses....	91,361,507	90,882,039
Depreciation	7,290,000	7,290,000
Total expenses	\$98,651,507	\$98,172,039
Net railway operating income	\$28,149,353	\$24,809,391
Miscellaneous receipts and charges (net)....	461,992	869,814
Interest charges	24,886,024	23,833,309
Net income	\$3,725,321	\$1,845,896

Total revenues represented an increase of £785,891, or \$3,819,430, over those for the preceding fiscal year. Freight traffic, including coal and livestock, produced income of £18,979,718, or about 73 per cent of the total, while passenger traffic yielded £5,546,515. A summary of the revenues reads as follows:

	1929	1928
Passenger	\$26,956,063	\$26,928,372
Baggage	3,255,724	3,099,173
General freight (exclusive of coal and live-stock)	70,705,617	66,145,523
Coal	18,553,283	18,918,726
Livestock	2,982,529	3,600,541
Other traffic	793,332	792,763
Miscellaneous revenue..	3,554,312	3,496,332
Total revenue	\$126,800,860	\$122,981,430

Expenses, which totaled £18,798,664, or \$91,361,507, represented an increase of only £98,656, or \$479,468, over those for 1927-1928. Operating department expenses, the largest single item in both years, also showed the largest increase. A detailed summary of expenses is as follows:

	1929	1928
Maintenance of way and structures	\$14,224,438	\$15,602,505
Maintenance of equipment	21,601,587	21,627,083
Operating	25,859,710	24,946,691
Traffic	22,195,416	22,025,442
Executive	2,578,920	1,944,355
Obsolescence	2,663,212	2,577,423
Trucking	2,238,224	2,158,540
Total expenses	\$91,361,507	\$90,882,039

The 1928-1929 operating ratio, 77.80, is slightly below the 1925-1926 ratio of 77.85, and compares with ratios of 80.68 and 79.83 for 1926-1927 and 1927-1928 respectively.

The combination of increased traffic and the relatively small increase in expenses, resulted in the largest net railway operating income reported during the last four years. A summary of revenues and expenses for that period,

with the latter including depreciation in the amount of £1,500,000 (\$7,290,000), reads as follows:

Fiscal year ending	Gross revenues	Operating expenses	Net railway operating income
March 31 1929	\$126,800,860	\$98,651,507	\$28,149,353
1928	122,981,430	98,172,039	24,809,391
1927	117,093,666	94,464,680	22,628,986
1926	117,375,838	91,053,680	26,322,159

Traffic and operating statistics for the year under review show that a total of 81,994,517 passengers were carried, the largest figure ever reported. As between 1928-1929 and 1927-1928, the gain of 339,647 in the number of individual passenger journeys resulted from an increase of 848,121 third class passengers, as first class trips fell off by 463,349 and second class by 45,125; and by growing long-distance travel, as the effect of highway motor coach competition was felt very keenly in some suburban areas, where there was a net loss of 151,218 passengers. Passenger revenue, however, has not kept up with the growth in traffic. While the number of passengers has increased 191 per cent in the last 20 years, passenger revenue has risen only 121 per cent, and has fallen off, from 27.9 per cent of the total revenue in 1919-1920, to 21.2 per cent in the year under review. Passenger train mileage has nearly doubled in the last few years, rising from 7,216,310 train-miles (21.4 per cent of the total), in 1919-1920, to 13,826,162 train-miles, or 27.7 per cent of the total, in 1928-1929.

Coal is still the most important commodity moving over the S. A. R., 9,694,162 tons being handled in 1928-1929, as against 12,344,078 tons of all other goods and 4,400,748 head of cattle and livestock. The relative importance of coal appears to be on the decline, however, for while the tonnage of other goods moved in 1928-1929 was the highest on record, coal tonnage was smaller than in 1925-1926 or 1926-1927, and only 122,043 tons over the 1927-1928 figure. Other commodities moving in great volume during the year were agricultural products, 5,086,857 tons; minerals and ores, other than coal, 1,594,573 tons; general merchandise, 1,566,406 tons, and building materials, 1,276,395 tons. All except the last moved in larger volume than in the preceding fiscal year. The average haul per ton of revenue freight was 227 miles, while the total ton-mileage of 22,038,240 tons of revenue freight, plus livestock, was 5,080,911,715. In addition, 4,459,889 tons of company freight were handled a distance equivalent to 1,635,496,207 ton-miles. The average net trainload, including both revenue and non-revenue freight, was 201 tons.

The total mileage of line open to traffic on the South African system on March 31, 1929, was 11,751 miles of 3 ft. 6 in. gage, and 896 miles of 2 ft. gage. Total revenue per mile of line amounted to £2,068, or \$10,050, while expenses, on the same basis, came to £1,609, or \$7,804. Equipment in use on the same date included, for 3 ft. 6 in. gage service, 2,044 steam and 95 electric locomotives, 3,633 passenger cars and 36,383 freight cars; and for 2 ft. gage service, 79 locomotives, 125 passenger cars and 997 freight cars. Locomotives ran a total

of 13,916,659 miles, while trains made 49,817,344 train miles, with revenue per train-mile amounting to \$2.51 and expenses to \$1.96. The total capital investment in lines and equipment, on March 31, 1929, was £137,780,932 (\$669,615,330), while the total number of permanent employees was 84,405, of whom 52,526 were European.

Important developments during the year included the opening of 193 miles of new line; the inauguration of deluxe, extra fare passenger service on long runs; an increase of 1,936 miles in the S. A. R. highway services, described in the *Railway Age*, Motor Transport Section, of March 22, page 747, and the beginning, at a cost of £1,243,807 (\$6,044,902) of electric service on the Capetown-Simonstown line. The first eight months of electric operation on this line resulted in a loss of £215,000, which compares with a loss of £96,000 during the last eight months of steam operation. Car shortages during times of heavy seasonal traffic, although less marked than in some former years, were a source of considerable difficulty.

German National Railroad Company in 1929

The German National Railroad Company for the year ending December 31, 1929, reported net receipts equivalent to \$204,751,000 as compared with a 1928 figure of \$205,822,000. The net receipts of the past year were also below the \$209,559,000 reported in 1927 but were approximately equal to the 1926 net of \$204,728,000.

Gross revenues for 1929 were equivalent to \$1,274,204,000 and operating expenses totaled \$1,069,453,000; respective 1928 figures were \$1,227,890,000 and \$1,022,067,000. It will thus be seen that while 1929 revenues were \$46,314,000 greater than those of 1928 operating expenses of last year increased slightly more than revenues or by \$47,386,800 and thus brought about the \$1,071,000 drop in net receipts. The principal cause of the increased operating expenses, the report points out, was the increased wage award which became effective in May, 1929.

Figures comparing receipts, expenses and net receipts of the past five years are as follows:

	Receipts (thousands of dollars)	Expenses (thousands of dollars)	Net Receipts (thousands of dollars)
1929	\$1,274,204	\$1,069,453	\$204,751
1928	1,227,890	1,022,067	205,822
1927	1,199,353	989,794	209,559
1926	1,080,710	875,983	204,728
1925	1,111,222	946,002	165,220

Dollar figures reproduced in the foregoing tabulation will not agree exactly with similar figures tabulated in the review of German railway operations for 1928, published in the *Railway Age* of August 3, 1929, page 360. This is because the rate of exchange current at the time was used in the 1928 review to convert reichmarks into dollars whereas in this discussion and its tabulations the par value of the reichmark—23.8 cents—has been used throughout.

The 1929 passenger and baggage revenues amounted to the equivalent of \$338,722,000 while freight revenues contributed \$829,525,000 and incidental receipts \$105,957,000 to the year's total receipts of \$1,

274,204,000. This distribution of revenue for the past three years is shown in the following tabulation:

	1929 (thousands of dollars)	1928 (thousands of dollars)	1927 (thousands of dollars)
Passenger and baggage	\$338,722	\$343,506	\$328,345
Freight	829,525	779,783	767,883
Incidental	105,957	104,601	103,125
Total	\$1,274,204	\$1,227,890	\$1,199,353

It will thus be seen that while 1929 passenger revenues were about \$5,000,000 less than those of 1928 they were approximately \$10,000,000 more than those of 1927. The 1929 freight revenues were approximately \$50,000,000 more than those of 1928 and \$62,000,000 more than 1927; incidental receipts remained virtually the same for the three years.

During the past year a total of 1,980,300,000 passengers were carried as compared with 2,009,400,000 in 1928 and 1,909,200,000 in 1927. In the performance of this service passenger equipment produced 417,381,000 train kilometers as compared with 394,581,000 train kilometers in the previous year when more passengers were carried. Freight trains during 1929 performed 259,780,000 train kilometers and 179,272,000,000 metric ton kilometers to produce 80,650,000,000 net ton kilometers on the 485,921,000 tons of freight hauled. In the previous year 480,966,000 tons of freight were handled with an output of 247,232,000 train kilometers, 172,254,000,000 gross ton kilometers, and 77,738,000,000 net ton kilometers.

Of highway competition for freight traffic the report says:

"While merchandise of higher value showed an increasingly strong tendency to take to the roads, freight traffic in bulk goods increased from the end of March onwards to such an extent that the total volume carried exceeded that of 1928. The method of conveying merchandise in large freight cars working to fixed timetables is, in consequence of the advantages attaching thereto, finding ever more users. Parcels traffic has been improved by the introduction of so called 'light freight trains' which consist of only two fast-travelling cars; they facilitate and accelerate loading and unloading. In other respects, too, we have succeeded in substantially reducing the time taken in transit by overhauling and reorganizing our systems. By these means and by offering rates to suit the circumstances we are endeavoring to meet the ever-increasing competition of motor traffic. This traffic threatens to assume proportions which make it extremely difficult, if not absolutely impossible, for the German National Railroad Company to fulfil its function as the leading transport undertaking in Germany, bound to consider the economic interests of Germany as a whole. While it is admittedly essential that the motor truck should play its part in the transportation system of the country in so far as its employment is economically justifiable, it must be pointed out that this aim cannot be achieved by any measures which the Railroad Company alone can take. It may be mentioned, for instance, that an agreement has been concluded with the Post Office to ensure the organization of cross-country passenger and freight transport by road."

Equipment and Supplies

Locomotives

THE CHICAGO GREAT WESTERN has ordered 15 locomotives of the 2-10-4 type from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of April 26.

Freight Cars

THE STANDARD OIL COMPANY OF INDIANA is inquiring for seven gondola cars of 50 tons' capacity.

THE AMERICAN SMELTING & REFINING COMPANY has ordered 75 gondola cars of 25 tons' capacity from the Koppel Industrial Car & Equipment Company. Inquiry for this equipment was reported in the *Railway Age* of August 16.

THE ILLINOIS STEEL COMPANY has ordered five steel flat cars of 100 tons' capacity and 95 ingot cars, from the American Car & Foundry Company. Inquiries for the above equipment were reported in the *Railway Age* of May 17 and July 26.

Signaling

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company material for an electro-pneumatic interlocking at MO Tower, Cresson, Pa.; 23 levers.

THE SOUTHERN PACIFIC has ordered from the Union Switch & Signal Company 91 semaphore signals, style B, upper quadrant, to be installed on its line be-

tween Tucumcari, N. M., and Santa Rosa, 55 miles, single track.

ALTHOUGH ALL INTERESTED PARTIES are generally agreed, according to Department of Commerce reports, that the government of Irak, as at present constituted, might well own and operate its own railways, final settlement of the question has been delayed because no agreement has been reached concerning the price which the Irak government should pay to Great Britain for the lines, equipment and rolling stock built and installed as war measures by the British Army of Occupation, and still owned by the British government. The inability of the two governments to agree is delaying the commercial and industrial progress of Irak, the reports state, because it is holding up the construction of an important line from Keruk to Mosul, as well as of other much needed lines and general improvements.

Both the British and Irak governments apparently want and are planning for the construction of a trunk line of railway from the port of Haifa, on the Mediterranean Sea, across Palestine, Transjordan and Irak to the Persian Gulf. As yet, however, money has not been provided for the construction of the projected line, although the British government is understood to have the improvement of Haifa harbor well under way, as a preliminary step. Another question which appears to be holding up the building of the new railway is the failure to arrive at a final decision as to the routing of a projected pipe line from Irak's rich oil fields to the Mediterranean. The French and Syrians argue for a route through Syria, while the British and Irakis favor a line through Transjordan and Palestine to Haifa. If the latter route is chosen, reports suggest that work on the railway and pipe line may begin simultaneously.

* * * *



Westbound on the Pennsylvania Near Sewickley, Pa.

Supply Trade

A. E. Biddle, vice-president in charge of sales of the Union Railway Equipment Company, Chicago, has resigned.

C. T. Connelly, representative of the Independent Pneumatic Tool Company, with headquarters at Detroit, Mich., has been appointed manager of the Buffalo, N. Y., office.

The National Battery Company, St. Paul, Minn., has purchased The Gould Storage Battery Company, New York. The Gould Company is one of the oldest manufacturers in the car lighting field. The National now has 22 branches and factories in the United States.

The Curtin-Howe Corporation, New York, has moved its Chicago office from 410 North Michigan avenue to 20 North Wacker drive. It has also established an office in the Security building, Minneapolis, Minn., which has been placed in charge of D. R. Manuel, of the Spokane, Wash., office, who has been appointed northwestern manager.

Victor W. Peterson has been elected president and general manager of the Shafer Bearing Corp., Chicago. He is also president of the Hannifin Manufacturing Company and the Sherman-Manson Manufacturing Company. He succeeds Julius E. Shafer who has been elected vice-president in charge of engineering. This company is extending its facilities by enlarging its research laboratory and engineering department.

Trade Publication

OIL ELECTRIC LOCOMOTIVES AND RAIL CARS.—A 60-page, illustrated publication of the Westinghouse Electric & Manufacturing Company, identified as Special Publication 1880, contains a description of the applications, operation, and construction of oil electric traction apparatus together with photographs and diagrams of many locomotives and cars. The publication gives a comprehensive analysis of the economies of oil electric locomotives and rail cars and comparative cost of operation. Short cut methods are indicated for picking out the right locomotive for the right application, and curves enabling the choice of the correct locomotive for a certain length run and for a certain grade are used to illustrate the text. Many photographs and diagrams are included showing the construction and operation of the oil engine-generator power plant. There are also photographs and specifications of 19 oil electric locomotives and rail cars, practically all of which are now in service.

You ARE under no strain, when you travel by train.—B. R. & P. Advt.

Construction

ABILENE & SOUTHERN.—The Interstate Commerce Commission, Division 4, has denied this company's application for a certificate authorizing the construction of an extension from Ballinger to San Angelo, Tex., 39 miles, on the ground that it is not required for local traffic but would tend to divert traffic now handled by lines of the Santa Fe system and that it would not effect any reduction in the short-line mileage from San Angelo to any point. The company is a subsidiary of the Texas & Pacific and a part of the Missouri Pacific system. The application was opposed by the Gulf, Colorado & Santa Fe and the Panhandle & Santa Fe on the ground that it would handicap the Santa Fe in the performance of its recently assumed undertaking to operate and strengthen the system of the Kansas City, Mexico & Orient. Chairman McManamy wrote a dissenting opinion, taking the position that the commission should affirm the finding proposed by the examiner that the certificate should be issued unless the Santa Fe proffers to the applicant a proper agreement providing for the use by it of its Ballinger-San Angelo line. Commissioner Meyer wrote a concurring opinion, taking the position that the Santa Fe, having taken over "the Orient cripple," should be afforded a more extended opportunity to work out its destiny on a more permanent basis before another strong system is authorized to divide the traffic with it.

ATLANTA, BIRMINGHAM & COAST.—This company has awarded to the Capitol Construction Company of Atlanta, Ga., a contract for the construction of a one-story freight warehouse, 36 ft. by 280 ft., to cost about \$30,000, at Bellwood, Atlanta.

BALTIMORE & OHIO.—A contract has been awarded by this company to the Ellington-Miller Company, Chicago, for the construction of a new freight terminal, for use by the Universal Carloading & Distributing Company, at Pittsburgh, Pa. The site of the new terminal extends along the Baltimore & Ohio tracks adjacent to the Allegheny river, from a short distance east of Manchester bridge to Scotland street, while its main units will be a two-story office building 45 ft. by 80 ft., a two-story steel freight shed 45 ft. by 603 ft., and a loading platform 200 ft. long at the west end of this shed. Loading tracks, which will connect with the Northside line of the Baltimore & Ohio near the Manchester bridge, will extend the length of the freight shed on its north side, while truck driveways will be provided from Scotland street. Ground has already been broken for the new terminal, and construction of buildings, which are expected to cost more than \$100,000, will start as soon as the necessary city building permits can be obtained. The new terminal is to be used for assembling and delivering freight by the Universal Carloading and Distributing Company, which has been handling freight

for the Baltimore & Ohio in the Pittsburgh district for some time.

CANADIAN NATIONAL.—This company plans the immediate reconstruction of its dock at the foot of Main street, Vancouver, B. C., which was destroyed by fire on August 10 with a loss of more than \$1,000,000. This dock, construction of which was recently completed by the Northern Construction Company, was to have been turned over to the railroad on August 12.

CHICAGO, BURLINGTON, & QUINCY.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the construction of an electric cinder plant at Galesburg, Ill.

CHICAGO, BURLINGTON & QUINCY.—A contract has been let to Joseph E. Nelson & Sons Co., Chicago, for the construction of a two-story reinforced concrete, brick and steel warehouse at Galesburg, Ill., which will have outside dimensions of 60 ft. by 220 ft.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—The City of Minneapolis, Minn., has asked the district court to set aside a recent order of the Minnesota Railroad and Warehouse Commission requiring this railroad to elevate its line between the passenger station in Minneapolis and East Twenty-Fourth street, because of dissatisfaction with the apportionment of costs. The commission directed that the railroad bear two-thirds and the city one-third of the total estimated cost of \$4,500,000. The city, in an ordinance, has expressed itself in favor of depression of the tracks, and in its petition to the court cites the fact that the total expense of elevation of the Great Northern and the Northern Pacific tracks was borne by the railroads. The St. Paul (Minn.) city council on August 14 voted for track depression as the basis upon which it will seek settlement of the West Seventh street grade separation project with the Milwaukee.

DELAWARE & HUDSON.—This company has awarded to Sweeney Bros., Scranton, Pa., contracts for the construction of a new freight house and freight station layout at Wyoming avenue, Scranton. The central unit of the new project is to be a fire-proof freight house of brick and steel construction, 400 ft. long by 50 ft. wide, a size which is estimated by railroad officials to be sufficient to care for freight handling requirements at Scranton for many years to come. The new freight house, which will be devoted entirely to receipt and delivery of 1. c. 1. freight, is to be served by concrete driveways from Wyoming avenue and by adjacent team tracks, which will also be served by ample driveway facilities. A special track, equipped with a ramp drive, will be constructed for the unloading of automobiles. Completion of the new terminal will also mean the transfer of the company's freight offices to the Wyoming avenue location, where suitable quarters for the company's entire local staff will be provided, although deliveries of carload freight will be maintained at the company's present freight station on

Lackawanna avenue. Construction of the new layout is expected to start immediately.

ERIE.—Plans filed by this company for work in connection with the elimination of its Starin avenue grade crossing, Buffalo, N. Y., have been approved by the Public Service Commission of New York.

FORT WORTH & DENVER NORTHERN.—The Interstate Commerce Commission has issued a report on reargument of the case in which Division 4 recently authorized the construction of several lines in northern Texas, and has issued a certificate authorizing this company, a subsidiary of the Burlington system, to build a new line between Childress and Pampa, Tex., 110 miles. Division 4 had, in the original report, denied the application as regards this line. Reargument was heard on petition of the Burlington. The certificate is issued on condition that the Burlington and the Chicago, Rock Island & Pacific shall arrange for joint construction and operation of a line from Shamrock to Wellington, Tex., 26 miles, which was part of a line which the commission authorized the Rock Island to build and which would be paralleled by the Burlington project. The Burlington application was opposed by the Rock Island and also by the Atchison, Topeka & Santa Fe. The commission also modified the certificate originally issued to the Rock Island to include the condition as to joint construction and operation. The report says that "while the traffic and revenue estimates of the Burlington may be somewhat optimistic it appears that after making allowance for that fact there clearly remains a public convenience and necessity to be served by the proposed line. On the other hand we believe that the fears and apprehensions expressed by the Rock Island and Santa Fe indicate undue pessimism." It added, however, that there is no need for two lines between Shamrock and Wellington. Commissioner Meyer dissented, saying that the proposed construction by the Burlington will add more than four millions of dollars to the aggregate investment in transportation facilities in this territory which the traffic must support and in which he could not find adequate justification. He said it appeared to him that the object of the law under which the commission acts is to avoid construction of new lines under the circumstances here existing.

GRAND TRUNK WESTERN.—This company plans to undertake the construction in the near future of a paved team track yard of 85-car capacity at Detroit, Mich., to replace facilities which have been removed in connection with the construction of a grade separation project. This yard will be equipped with a traveling gantry crane.

GREAT NORTHERN.—A contract for the complete construction of this company's portion of the Klamath Falls (Ore.)-Keddie (Cal.) joint line with the Western Pacific, that between Klamath Falls and Bieber, Cal., 89 miles, has been awarded to A. Guthrie & Co., Portland, Ore. Excavation on the new line will include

70,000 cu. yd. of lava rock, 6,500 cu. yd. of loose rock and 10,000 cu. yd. of common earth, while borrow quantities will include 1,500 cu. yd. of lava rock, 25,000 cu. yd. of loose rock, 57,500 cu. yd. of hard pan and 332,500 cu. yd. of common earth. The contract covers the construction of buildings and other structures in addition to grading, bridging and track laying.

LONG ISLAND.—The Public Service Commission of New York has granted a petition by the State Department of Public Works asking for a change in the railroad bridge carrying this company's tracks over the North Hempstead turnpike in the town of North Hempstead, N. Y., in connection with the widening of the highway. The existing bridge at this point is to be replaced by a new railroad bridge 2,152 ft. long and located 475 ft. west of the present structure. The estimated cost of the work, which is to be done by the railroad, is \$281,000.

NEW YORK CENTRAL.—This company has recently awarded contracts for the construction of a highway viaduct over its tracks at Moline, Ohio, at a cost of \$300,000, and for the construction of a 76-ft. track scale at Corning, Ohio, at a cost of \$40,000.

NEW YORK CENTRAL-NEW YORK, CHICAGO & ST. LOUIS-PENNSYLVANIA.—The New York Public Service Commission has advised these companies that it does not consider excessive the bid of \$111,143, submitted by the Bates & Rogers Construction Company, Cleveland, Ohio, for work in connection with the elimination of their Athol Springs road crossing in Hamburg, N. Y., and has directed the railroads to award the necessary contracts.

NEW YORK, CHICAGO & ST. LOUIS.—A contract for the construction of the substructure for a highway bridge at Woodland avenue, Cleveland, Ohio, has been awarded to the Marsh Hart Company at a cost of about \$94,000, while the contract for the superstructure of this bridge has been let to the Bethlehem Steel Company at a cost of \$57,000. A contract has been let to the H. E. Culbertson Company for the construction of the substructure and the necessary grading, at a cost of \$120,000, for a bridge at Angola, N. Y. The superstructure for this bridge will be supplied by the American Bridge Company at a cost of \$58,000.

NORTHERN PACIFIC.—A contract for the construction of an extension to the roundhouse at Duluth, Minn., has been awarded to George H. Lounsbury & Son, Duluth, at a cost of about \$42,000. A contract has been let to the Carl J. Steen Company, Grand Forks, N. D., for the construction of a machine shop at Glendive, Mont., at a cost of \$30,000.

PITTSBURGH & WEST VIRGINIA.—A contract was awarded by this company on August 7 to the Vang Construction Company, Pittsburgh, Pa., for the construction of a branch line extending from a point near Jacob's Creek, Pa., to a connection

with the Donora Southern, a distance of 5.75 miles. This contract covers the moving of approximately 850,000 cu. yd. of dirt, the construction of two tunnels, one 1,650 ft. in length and the other 400 ft. in length, and the masonry for three large steel viaducts, at a total cost of approximately \$1,750,000. Work is to be started at once with the idea of completing it by December 1.

TEXAS & PACIFIC-ST. LOUIS-SAN FRANCISCO.—A contract has been awarded to H. K. McCollum, Fort Worth, Tex., for the construction of a highway subway under the tracks of these railroads at Henderson street, Fort Worth. This project, which will be paid for jointly by the railroads and the city, will involve a total expenditure of about \$491,000.

UNION PACIFIC.—A contract for the construction of an electric cinder plant at Hastings, Neb., has been let to the Roberts & Schaefer Company, Chicago.

UNION PACIFIC.—This company plans the construction of a new freight classification yard with accompanying facilities at Cheyenne, Wyo. This yard, which will be constructed south of the present shop grounds, will consist of 36 miles of track, including new westbound and eastbound train yards and new car-repair facilities. These will be made up of 18 train yard tracks having a capacity of 140 cars each, four car-repair tracks, each about 2,000 ft. long, and a number of caboose tracks. Bids have been requested for the grading—about 500,000 cu. yd. of earth excavation and borrow—and for the construction of the substructure of a 12-track bridge over Crow creek, which will involve 1,000 cu. yd. of excavation, 14,000 lin. ft. of foundation piling, 3,800 cu. yd. of concrete and 50 tons of reinforcing steel. The superstructure of the two-span bridge will be constructed by company forces. It will consist of a concrete slab deck supported by 50-ft. steel plate girders, giving the bridge a length of 101 ft. between faces of abutments. The improvement also requires the construction of a new interlocking plant at the west end of the freight yard and the removal of the present stock yard to a location west of the Colorado & Southern overhead crossing. The stock yard will include covered pens in an area of 110 ft. by 430 ft. and open pens in an area of 90 ft. by 430 ft.

UNION TERMINAL COMPANY.—A contract has been let to T. H. Johnson, Dallas, Tex., for the construction of a highway subway under the tracks of this company at Cadiz street, Dallas, at a cost of about \$160,000. The city's portion of this construction, consisting of approaches on Cadiz street, has been undertaken by the same contractor at a cost of \$85,000.

UNDER AN AGREEMENT with the Persian Government, a group of German contractors has agreed to complete the 128 kilometers (about 80 miles) of the northern section of the trans-Persian railroad from the Caspian Sea to Hamadan.

Financial

CEMENT, TOLENAS & TIDEWATER.—Abandonment.—This company has been authorized by the Interstate Commerce Commission to abandon its entire line of railroad, 1.9 miles, extending from Tolonas to Cement in Solano county, Cal.

CENTRAL OF NEW JERSEY.—Equipment Trust.—The International Manhattan Company, Inc., and R. W. Pressprich & Co. are offering, subject to the approval of the Interstate Commerce Commission, \$1,166,000 of 4½ per cent equipment trust of 1926 certificates of this company, maturing in installments from 1931 to 1941 at prices to yield from 3.25 per cent to 4.2 per cent.

CIMARRON & NORTHWESTERN.—Abandonment.—This company has been authorized by the Interstate Commerce Commission to abandon its line in Colfax County, N. M.

DETROIT, TOLEDO & IRONTON.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Port William to Kingman, Ohio, 9.43 miles.

GREAT NORTHERN PACIFIC.—Unification Case.—This company and the Great Northern and Northern Pacific have filed with the Interstate Commerce Commission a reply to the various petitions filed by western state commissions that are asking the commission to re-open the proceedings in the unification case for rehearing or reargument. Such a re-opening would serve no useful service, the roads say, and would be premature since the commission has withheld any order pending submission by applicants of a supplemental plan or proposal complying with the four requirements found by the commission to be necessary before it could approve the unification as being in the public interest. It is to be assumed, the reply states, that if and when such separate plan is submitted the commission will hold further hearings at which all parties may be heard. The companies deny many of the allegations made in the state petitions, including the one that the employees were not given an opportunity to be heard, stating that some of them were heard and that a large amount of evidence was taken as to the effect on the employees. The Illinois Commerce Commission has joined the list of states asking for a re-opening, adopting the petition filed by the Minnesota commission. The Nebraska state commission has also asked for a rehearing, stating that it is working out a plan to be submitted to the commission as to the best way of maintaining the present traffic relations between the Northern companies and the Burlington in case a separation of that line from the control of the Northerns is ordered.

The Railroad Commission of Wisconsin has also asked that the case be re-opened.

NORTHEAST OKLAHOMA.—Acquisition.—This company has applied to the Interstate

Commerce Commission for authority to acquire and operate as part of its electric railway line parts of the line of the Joplin-Pittsburg from Columbus to Cherokee Junction, Kan., and from Seaman to Mineral, Kan., 23.02 miles.

PENNSYLVANIA. — *Acquisition.* — This company and the Elmira & Lake Ontario have applied to the Interstate Commerce Commission for authority for the acquisition by the latter of the property of the Marion Railway, from Newark to Marion, N. Y., 8.38 miles, to be operated by the Pennsylvania under its lease of the Northern Central.

WICHITA NORTHWESTERN. — *Receivers.* — Col. Lee H. Landis has been appointed co-receiver (with O. P. Byers) of this property, with headquarters at Hutchinson, Kan.

Dividends Declared

Boston & Maine. — Common, 1 per cent, quarterly; Prior Preference, 1 1/4 per cent, quarterly; 6 Per Cent Preferred, 1 1/2 per cent, quarterly; First Preferred, Class A, 1 1/4 per cent, quarterly; First Preferred, Class B, 2 per cent, quarterly; First Preferred, Class C, 1 1/4 per cent, quarterly; First Preferred, Class D, 2 1/2 per cent, quarterly; First Preferred, Class E, 1 1/2 per cent, quarterly, all payable October 1 to holders of record September 13.

Boston & Providence. — 2 1/4 per cent, quarterly, payable October 1 to holders of record September 20.

Pittsburgh, Youngstown & Ashtabula. — Preferred, 1 1/4 per cent, quarterly, payable September 2 to holders of record August 20.

Union Pacific. — Common, 2 1/2 per cent, quarterly; Preferred, 2 per cent, both payable October 1 to holders of record September 2.

Average Prices of Stocks and of Bonds

	Last	Last
Aug. 19	week	year
Average price of 20 representative railway stocks.	113.11	110.63
Average price of 20 representative railway bonds.	94.91	94.92
		89.86

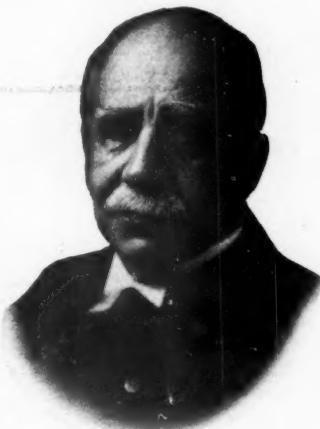
CANADA CALLS ITSELF the chief source of the world's paper supply. In one month Canadian paper has been exported to 33 countries, ranging through the alphabet right from Australia to Uruguay. While Canada's principal export of paper is for printing purposes there is an interesting variety of other paper products. Wrapping paper, writing paper and wall paper are exported to many countries, and in June paper wall boards for building purposes were exported to the United Kingdom to the amount of 500 tons.

KENNETH CANTLIE, formerly chief operating officer of the Jodhpur Railway of India, has been appointed consulting expert on equipment standardization to the Ministry of Railways, National government of the Republic of China. Mr. Cantlie, who received his early training in the Crewe (England) shops of the London & North Western (now part of the London, Midland & Scottish), served until 1924 in various capacities in the mechanical, operating and marine departments of the Entre Rios and North East Argentine Railways, in the Argentine Republic. In 1924, he accepted the position of assistant superintendent of motive power with the Jodhpur Railway (India), later taking charge of the car department of that road. Two years later he was transferred to the operating department, and during 1928 served as chief operating officer.

Executive

L. C. Fritch, vice-president of the Chicago, Rock Island & Pacific at Chicago, has also been elected president of the Denver (Colo.) Union Terminal for the ensuing year, succeeding **J. S. Pyeatt**, president of the Denver & Rio Grande Western at Denver, who has been elected vice-president.

Horace Johnson, who has retired as president and general manager of the Duluth & Iron Range, had a railroad career of 53 years, 42 years of which



Horace Johnson

were spent in the service of the D. & I. R., his election to the presidency having occurred on May 11, 1926. A sketch of Mr. Johnson's career appeared in the *Railway Age* of August 16, page 345.

Operating

H. G. Warvel resigned on July 31 as assistant trainmaster of the Grand Rapids division of the Pennsylvania.

James E. Craver, general superintendent of the Northern Pacific lines west of Paradise, Mont., has been promoted to general manager of the western lines, with headquarters as before at Seattle, Wash., succeeding **Thomas H. Lantry**, deceased.

The jurisdiction of **M. M. Sisson**, assistant general manager of the First district of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been extended to include the Second district. **C. J. Stephenson**, assistant general manager of the Second district, has been appointed assistant to the general manager, with headquarters as before at Springfield. **W. H. Bevans**, who was granted a leave of absence on July 12, resumed his duties as superintendent of the Northern division, with headquarters at Fort Scott, Kan., on August 16, succeeding **E. E. Carter**, acting superintendent of that division, who has been assigned to other duties.

W. H. Strachan, general superintendent of the lines of the Northern Pacific east of Mandan, N. D., has been appointed assistant general manager of the lines east of Helena, Mont., and Butte, with headquarters as before at St. Paul, Minn. **T. F. Lowry**, general superintendent of the lines between Mandan and Paradise, Mont., with headquarters at Livingston, Mont., has been appointed assistant general manager of the lines west of Helena and Butte, with headquarters at Seattle, Wash. These changes, which become effective on September 1, are occasioned by the abolition of three general superintendents' districts and their consolidation into lines east and lines west of Helena and Butte.

The jurisdiction of **E. A. Sollitt**, general superintendent of the Eastern district of the Wabash, with headquarters at St. Louis, Mo., was extended over the entire system on August 15 and the position of general superintendent of the Western district, with headquarters at St. Louis, which had been occupied by **W. W. Greenland**, was abolished. Mr. Greenland has been appointed superintendent of the Western division, with headquarters at Moberly, Mo., succeeding **R. A. Messmore**, who has been transferred to the Springfield division, with headquarters at Springfield, Ill. Mr. Messmore replaces **H. O. Kelley**, who has been transferred to the Peru division, with headquarters at Peru, Ind.

C. E. Smyer, superintendent of the Arkansas River division of the Atchison, Topeka & Santa Fe, with headquarters at La Junta, Colo., has been transferred to the Colorado division at Pueblo, Colo., effective September 1, and on that date the Arkansas River division will be consolidated with the Colorado division. Mr. Smyer will succeed **H. A. Tice**, who has been appointed special representative of the general manager of the Western lines at Pueblo. **B. A. West**, superintendent of the Rio Grande division, has been appointed assistant superintendent of the New Mexico division, with headquarters as before at Albuquerque, N. M. This appointment becomes effective on September 1, in connection with the consolidation of the Rio Grande division with the New Mexico division, of which **H. R. McKee** is superintendent, with headquarters at Las Vegas, N. M.

Charles A. Manthe, who has been promoted to division superintendent on the Great Northern at Klamath Falls, Ore., has been in the service of that road continuously for more than 27 years. He was born at Steele, N. D., on October 29, 1885, and after attending public school at St. Cloud, Minn., obtained his first railway experience on March 17,

1903, as a stenographer in the office of the general manager of the Great Northern at St. Paul, Minn. Mr. Manthe then served successively as secretary to



Charles A. Manthe

the general superintendent and to the general manager and as chief clerk in the general manager's office. On March 15, 1913, he was advanced to trainmaster at Melrose, Minn., then being transferred to Marcus, Wash., and to Spokane. He was appointed division superintendent at Crookston, Minn., on April 1, 1920, and on May 1, 1922, upon the occasion of a consolidation of divisions, he became trainmaster at Spokane. Mr. Manthe was transferred to Seattle, Wash., as terminal trainmaster on January 1, 1928, his promotion to superintendent at Klamath Falls becoming effective on August 1.

Traffic

W. W. W. Arthur has been appointed assistant to the freight traffic manager of the Southern Pacific lines at Chicago.

H. L. Pigott, assistant general passenger agent of the Wabash at St. Louis, Mo., has been transferred to Chicago, succeeding **John Maloney**, resigned.

John F. Gaffney, Jr., assistant general passenger agent of the Nashville, Chattanooga & St. Louis, has been promoted to general passenger agent with headquarters as before at Nashville, Tenn.

W. P. Shehee has been appointed general agent for the Chicago, Springfield & St. Louis at Shreveport, La. **L. N. St. John** has been appointed general agent at Kansas City, Mo.

A. S. Kennickell, Jr., has been appointed general agent of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad in the Carolina territory, with headquarters as before at Winston-Salem, N. C.

William I. Lightfoot, general passenger agent of the N. C. & St. L., who has been appointed general passenger agent of the Louisville & Nashville, with headquarters at Louisville, Ky., has

been connected with the Nashville, Chattanooga & St. Louis for 34 years. He was born at Fordyce, Ark., on May 27, 1875, and attended both public schools and a state university. On July 6, 1896, Mr. Lightfoot entered railway service as secretary to the assistant general passenger agent of the N. C. & St. L. and from 1897 to 1907 filled the positions successively of rate clerk and chief rate clerk on that road. In January of the



William I. Lightfoot

latter year he was promoted to assistant general passenger agent at Nashville, Tenn., and in January, 1917, he was further promoted to general passenger agent at the same point. His appointment as general passenger agent of the Louisville & Nashville became effective on August 15.

Engineering, Maintenance of Way and Signaling

The system engineering offices of the Seaboard Air Line, including those of **W. D. Fauchette**, chief engineer; **J. C. Williams**, engineer of buildings; **J. L. Kirby**, engineer maintenance of way, and **F. H. Bagley**, signal engineer, have been transferred from Savannah, Ga., to Norfolk, Va.

Mechanical

William L. Kinsell has been appointed superintendent motive power and equipment of the Alaska Railroad, with headquarters at Anchorage, Alaska. Mr. Kinsell was graduated from the University of Minnesota in 1900, in the department of electrical engineering, and for a number of years was connected with the mechanical departments of railroads in the Northwest.

Purchases and Stores

H. C. Youngs, lumber buyer for the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to tie and timber agent, with headquarters as before at Chicago, succeeding **F. S. Pooler**, tie agent, who has retired.

Obituary

Samuel J. Parks, who retired as auditor of freight accounts of the Wabash, with headquarters at St. Louis, Mo., in 1924, died from heart disease at St. Johns hospital, St. Louis, on August 17. Mr. Parks was 60 years of age.

Harry C. A. Maisonneuve, publicity agent of the Pere Marquette and editor of the Pere Marquette Magazine, with headquarters at Detroit, Mich., died on August 20, at Tampico, Tam., on a special train carrying a party of American newspapermen en route to Mexico City. Mr. Maisonneuve had been advertising agent and publicity agent of the Pere Marquette since 1912 and a city editor of Detroit newspapers prior to that time. He was a vice-president of the American Association of Railway Advertising Agents.

Frederick L. Wanklyn, who retired in 1925 as general executive assistant of the Canadian Pacific, with headquarters at Montreal, Que., died at Grimsby, England, on August 3. Mr. Wanklyn was born in 1860 at Buenos Aires, Argentina, and obtained an engineering education in England. He spent 47 years with railway, mining and traction companies. This experience included the positions of engineer pupil at the Gorton works of the Manchester, Sheffield & Lincolnshire Railway at Manchester, England; resident engineer of the Lombardy Road Railways at Milan, Italy; assistant mechanical superintendent of the Grand Trunk (now part of the Canadian National); manager and chief engineer of the Toronto Railway; vice-president and chief engineer of the Montreal Street Railway; vice-president of the Dominion Coal Company, and, from 1912 to 1925, general executive assistant of the Canadian Pacific. Mr. Wanklyn came to Canada in 1881.

Edward B. Stahlman, formerly a vice-president of the Louisville, New Albany & Chicago (now part of the Chicago, Indianapolis & Louisville), and traffic manager of the Louisville & Nashville, and engaged in railway and express service from 1858 to 1884, died at Nashville, Tenn., on August 12, at the age of 87 years. A native of Germany, Mr. Stahlman came to the United States at the age of 10 and entered railway service when 15 years old in the construction department of the Baltimore & Ohio. Other positions held by him included clerk and assistant to superintendent of tunnel and other construction on the Louisville & Nashville, agent and cashier for the Adams Express Company at Chattanooga, Tenn., and Nashville, contracting agent, general agent, general freight agent and traffic manager of the L. & N., and assistant to the president, general traffic manager and second vice-president of the L. N. A. & C. Mr. Stahlman left railway service in 1884 and in the following year purchased the Nashville Banner, of which he was publisher at the time of his death.

Railway Age

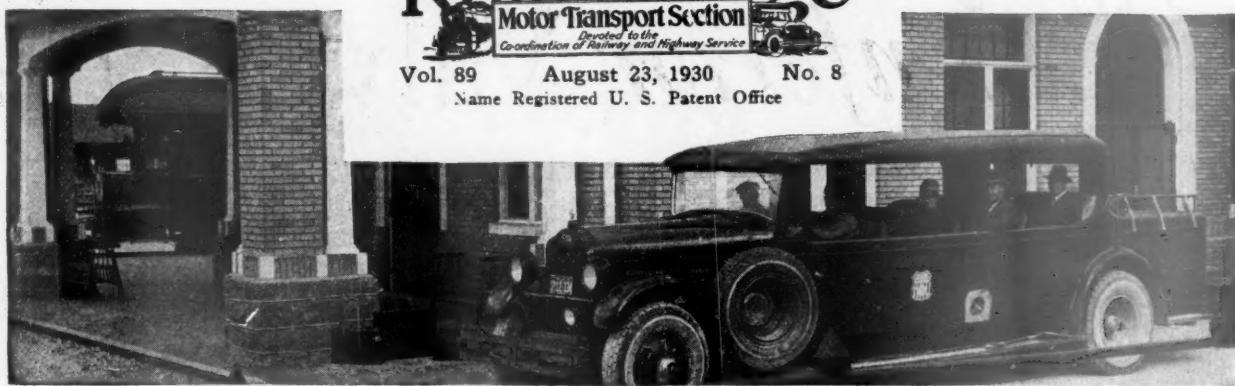
Motor Transport Section

Devoted to the

Coordination of Railway and Highway Service

Vol. 89 August 23, 1930 No. 8

Name Registered U. S. Patent Office



Contents

The Motor Coach Engine—Yesterday, Today, Tomorrow Page 394

Carl Abell outlines the remarkable changes which have accompanied the development of motor coach engines and discusses the past, present and future trends in engine design.

Give the Cooling System Proper Attention 402

An article by Wm. H. Wilson which calls attention to the difficulties which result from failure to keep cylinder block free from rust and sludge, and suggests a cleaning method to prevent overheating.

Solving the Problem of the Unprofitable Train 405

Tells how one road studied its service and traffic to determine the advisability of replacing steam train service with rail cars and motor vehicles.

EDITORIALS

Co-operation or Competition?	391
Motor Truck Operating Costs	392
Are Maintenance Methods Advancing or Static?	392
The "Head-End Traffic" Problem	393
The Ever-Changing Motor Coach Engine	393

GENERAL ARTICLES

The Motor Coach Engine—Yesterday, Today, Tomorrow, by Carl Abell	394
What Makes a Good Garage?	400
Give the Cooling System Proper Attention, by Wm. H. Wilson	402
Solving the Problem of the Unprofitable Train	405
D. V. Handles All Passenger Traffic by Motor Coach	407
Self-Maintenance Compared with Service Station Maintenance, by H. V. Middleworth	409

GENERAL ARTICLES—Continued

Keeping Oil Containers Clean 410

NEW EQUIPMENT

Increased Power and Speed in Federal 3-Ton Truck	411
La France-Republic Builds a New Series of 2½-Ton Trucks	412
Rusco Brake Lining Grinder	412
Sioux Utility Machine	413
Brill Multi-tool	413
Paasche Multicolor Airbrush	413
J-M Composition Flooring and Body Insulation	414
Sanding and Polishing Outfit	414

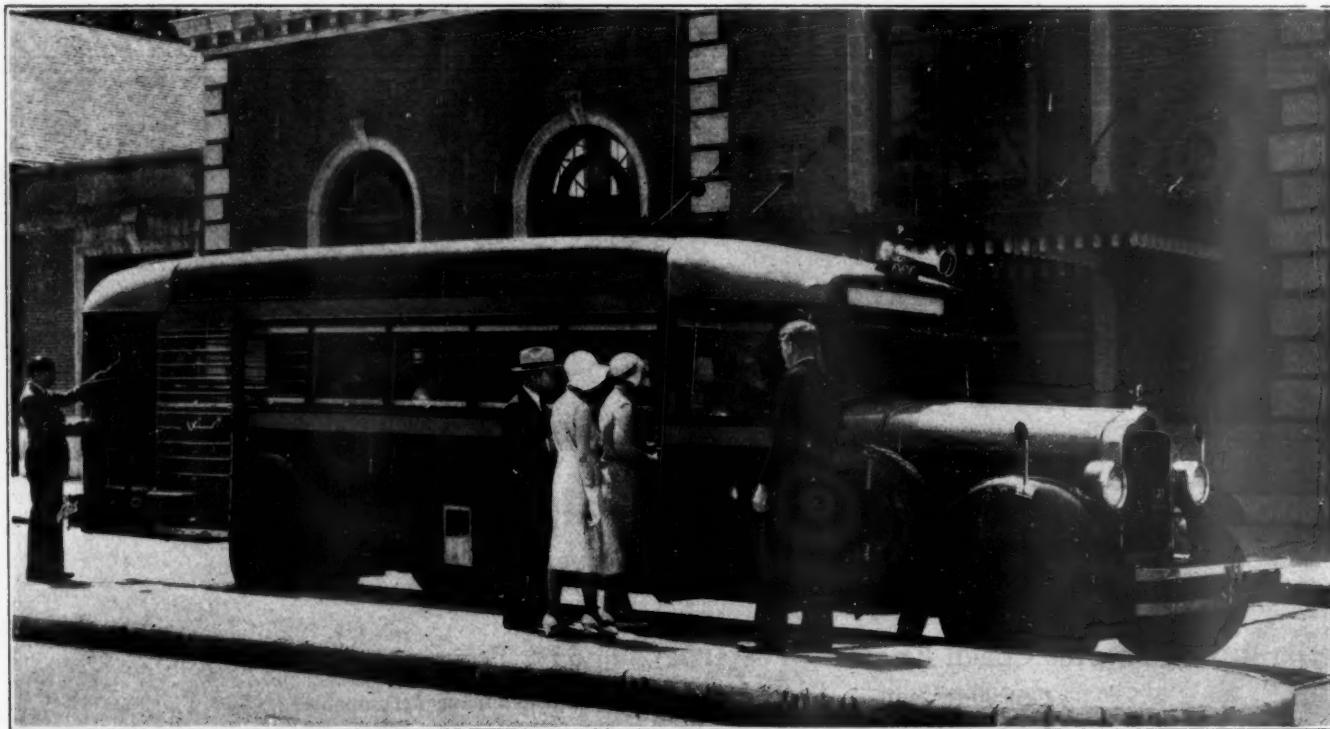
EVERY-DAY PROBLEMS OF MOTOR COACH AND TRUCK OPERATION 415

MOTOR TRANSPORT NEWS 419

F. L. Jacobus
Associate Editor

John C. Emery
Motor Transport Editor

Walter J. Taft
Associate Editor



White Model 54 Combination Passenger, Mail, Baggage and Express Coach

Combination Passenger and Express Coach for Railroad Use

THE White Combination Passenger and Express Coach, specially designed for railroad use, is a dependable and economical transportation unit for replacing local passenger trains and for feeder service.

By replacing unprofitable passenger train service with White Combination Coaches railroads, in many instances, can save money and, at the same time, provide a better service to the public.

The standard White Combination Coach seats 16 passengers, with additional emergency seats to care for overflow loads. The rear cargo compartment for the carrying of mail, baggage and express contains about 350 cubic feet of space. Sizes of passenger and express compart-

ments may be varied to fit the particular needs of the operator. White Combination Coaches are furnished in a variety of wheelbases.

White Bus equipment is used extensively by leading railroads throughout the United States. White service facilities are available everywhere and at reasonable cost.

Before you purchase additional bus equipment it will pay you to investigate what White has to offer.

THE WHITE COMPANY, Cleveland

WHITE BUSSES

And WHITE TRUCKS

Co-operation or Competition?

UNTIL recently it was a case of railways versus independent motor coach operators in the competition for passenger traffic. Lately, however, there have developed numerous instances in which railway motor coach lines are competing with other railways for passenger traffic, or in which the motor coach lines of two or more railways are competing with each other. These occurrences have aroused no small amount of excitement at several times in the recent past, and it seems inevitable that a continuation of the present trend toward competition will result in even more excitement in the future.

Competition is the life of trade, says the well known adage, but it may also be the death of concerns operating on as slender a margin of profit as many railway lines and most motor coach lines. There is and for many years has been competition between two or more railways for passenger traffic moving between most centers of population of any size. As more railways engage in motor coach operation, it follows quite naturally that there should be similar competition between the motor coaches operated by the competing railways between these common points, and such competition is not to be deplored. But if motor coaches are used by one railway in such a manner as to create excessive and unwarranted competition with its neighbors, a situation is almost certain to arise in which both sides will be losers.

Railways Should Work Together

There would seem to be sound reasons why railway motor coach lines should work together rather than against each other. The entirely independent motor coach operator still exists in large numbers. It would appear to be good business practice for railway motor coach lines to work together against this common competitor. Yet, in a surprising number of instances, this is not being done. In one instance, for example, a railway motor coach line, handling a substantial volume of through traffic moving to destination points at some distance beyond its own principal terminal, is bending every effort to turn this traffic over to an independent line at the transfer point, in spite of the fact that a motor coach

line controlled by another railway provides just as good service from the transfer point to the same destinations.

The reason for this is that the railway, whose motor coaches are not receiving this interchange traffic, in a rather roundabout way has an interest in another motor coach line which competes with the motor coach lines of the first railway. In short, these railways, instead of co-operating in competition with the independent lines are helping them out in a most substantial way. It would be too much to say that the independent lines are the sworn enemies of the railways and that the railways should band together to stamp them out as an unmitigated evil. On the other hand, so long as the independent lines are co-operating with each other in the competition for through traffic, it would appear advisable that the railways have their motor coach lines do the same thing. Yet in several instances, like the one mentioned, they are not doing so.

"Foreign" Territory Invaded

Back of much of the competition that has developed among railways and among railway motor coach lines is the purchase by a half dozen or so leading railways of interests of varying size in certain extensive and previously independent motor coach operating systems. By such purchases these railways, either directly or indirectly, have so to speak, "gotten off the reservation" and have invaded territory foreign to their railway lines.

That such acquisitions have been effected without legal or moral transgression goes without saying. These railways have doubtless acted entirely within their rights and with good business judgment. Nevertheless, it cannot be denied that these "invasions" by several railways of the territories of many other railways is potentially, if not at present, a source of trouble of competition rather than of co-operation.

In at least two instances, railway motor coach lines, after a period of most determined competition, have reached an agreement for co-operative action which has proved and should continue to prove beneficial to both. In these cases, the competing lines, in their struggle for

traffic, created an excessive amount of service which had the inevitable result of greatly increasing operating expenses and substantially reducing revenues per motor coach mile. Under the co-operative arrangement now in effect, the patrons of these lines are receiving excellent service and the railway motor coach lines have reduced their operating expenses without loss of revenue.

The motor coach operations of the steam railways are expanding rapidly. The experiences of a number of roads have proved the advantages which the motor coach has to offer when operated in close co-ordination with railway service. Hence, it is reasonable to expect that motor coaches will be an even more important part of railway equipment in the future. It is believed that competition among railway motor coach lines if carried to unnatural extremes, will hamper rather than encourage the development of co-ordinated railway and highway transportation in directions which will result in benefits to the public and to the railways alike. Much harm can be done by reckless competition; much good, by unselfish co-operation.

Motor Truck Operating Costs

A MOST interesting analysis of motor truck operating costs has been prepared by the General Motors Truck Company, from replies to a questionnaire which it submitted to several thousand motor truck operators who are using this equipment in all manner of ways. The analysis is based upon information furnished by 5,584 truck users who own and operate 46,017 motor trucks, and this would seem to be a sufficient number to indicate the value of the average operating costs shown for purposes of comparison with individual truck operations, or for estimating costs in planning such operations.

The truck users represented in the analysis range from auto supplies and accessories firms to gas, electric and water utilities, but to railways the reports of companies engaged in the general trucking business will probably be of greatest interest. In this classification 339 firms reported, these companies using 993 light duty trucks with capacities from $\frac{1}{2}$ to $1\frac{1}{2}$ tons, 1,007 medium duty trucks with capacities from $1\frac{1}{2}$ to 3 tons, and 534 heavy duty trucks with capacities from $3\frac{1}{2}$ tons upward, or a total of 2,534 trucks. On the question of how many miles they are getting per gallon of gasoline, the users of light duty trucks reported 12.7 miles, the users of medium duty trucks, 9.3 miles, and the users of heavy duty trucks, 5.7 miles. The average pay load reported by the users of light duty trucks was 3,313 lb., medium duty trucks, 6,935 lb., and heavy duty trucks, 14,442 lb. The average length of haul or route in these three groups was 44 miles, 63.4 miles and 74.4 miles, respectively, while the average number

of stops per day was, respectively, 34, 19 and 22. The total truck operating costs, including maintenance and depreciation, reported by the users of light duty trucks was 13.2 cents per mile, by the users of medium duty trucks, 17.1 cents per mile, and by the users of heavy duty trucks, 23.6 cents per mile.

To the many railway officers who have attempted to secure accurate average figures on motor truck operating costs, with but little if any success, this analysis should be of considerable interest.

Are Maintenance Methods Advancing or Static?

AT the recent semi-annual meeting of the Society of Automotive Engineers the suggestion that present day maintenance methods are little if any different from those of years ago was rather forcefully made by Captain Walter C. Thee, commanding officer of the Second Corps Area Motor Repair Shops of the United States Army. The maintenance systems at present employed, according to Captain Thee, are practically identical in principle with those of 10 or 15 years ago, except for the installation of modern shop equipment.

"To be specific," said Captain Thee, "I should say that very little has been done to apply to maintenance of motor vehicles fundamental principles of management that have been developed in industry during the last 10 to 15 years. I feel safe in saying, and I believe that many will agree with me, that the maintenance of motor vehicles has been stagnating and has progressed not nearly so fast in regard to economy and efficiency as the production of motor vehicles. The cause of this stagnation can be explained by saying that mass production has not been applied to the repair of unserviceable unit assemblies, and economic factors applying to mass production have not been considered in the repair of motor vehicles."

On the other hand, Captain Thee has words of commendation for the unit replacement system of maintenance, which is the one the most generally employed by railway motor coach operating companies of any size. According to the speaker, this system has been used exclusively by the United States Army, and whenever properly applied has been not only successful but also efficient and economical.

The weakness of most discussions of maintenance methods from the standpoint of individual application is that they must consider the subject only in a general way while the problem of maintaining motor vehicles is one which must be attacked from a different angle by almost every individual motor vehicle operator.

The size of the fleet of motor vehicles to be maintained has an important bearing upon the maintenance

method to be employed, while the distribution of the equipment over a small or a large area is an equally important factor. Operating conditions in general also affect the means of solution of the maintenance problem.

This is somewhat beside the point made by Captain Thee, however. With respect to their motor vehicle operations, the railways are perhaps fortunate in being rather new in the business, since on this account they do not have to outgrow any old fashioned practices, handed down from an earlier generation of men in charge of the maintenance of motor vehicles. The fact that most railway motor coach and truck operating companies have been quick to adopt the unit-replacement system of maintenance indicates that they at least, in the view of Captain Thee, are employing a truly modern maintenance system.

The "Head-End Traffic" Problem

HERE was extended discussion, at the Atlantic City meeting of the Motor Transport division, of the problem of handling "head-end traffic" in the event of the substitution of motor coaches for local passenger trains. It was rather clearly apparent that some railways are delaying the substitution of motor coach service for local train service because of the necessity of handling a substantial volume of mail, baggage and express traffic, the thought being that, desirable though such substitutions might be from the standpoint of operating economies, they cannot be effected because of the inability of highway equipment to accommodate heavy mail, baggage and express traffic.

Unquestionably, the problem of handling the mail, baggage and express traffic offered is one which must be given consideration in the making of any plans for the substitution of motor coaches for trains, but it is not ordinarily an insurmountable problem. This difficulty has been overcome in many instances by a number of railways and by a variety of methods. In some instances, motor coach and train schedules have been so worked out that heavy baggage and express can be held off the motor coaches and forwarded by train with but little loss of time. On at least one or two roads, the practice in substituting highway for railway service is to put both motor coaches and motor trucks in service, the coaches to handle passengers and the trucks to take care of the mail, baggage and express traffic. This procedure naturally is highly effective in handling the traffic, but it is expensive—although not perhaps as expensive as passenger train operation—and it would appear to be the proper solution of the problem only when the volume of "head-end traffic" is unusually heavy. A third expedient is the use of combination

motor coaches. These vehicles, which were developed not long ago to meet the demand for equipment especially designed for use by railways in substitution for local passenger trains, are of standard length with a passenger compartment forward, containing seats for 15 or 16 passengers, and a cargo compartment at the rear, which is completely shut off from the passenger end and which is so constructed as to be able to handle a large amount of heavy mail, baggage and express traffic with ease. Combination motor coaches of this kind are being used with success by several railways and they appear to offer one means of meeting the "head-end traffic" problem.

Facilities for the movement of mail, baggage and express have to be provided by railways, but under ordinary circumstances, there is no reason why this obligation should prevent the substitution of highway service for railway service if other factors are favorable to the substitution. The solution of the problem lies largely in the selection of the proper equipment, and such equipment is available.

The Ever-Changing Motor Coach Engine

FIFTY horsepower was once considered adequate for the heaviest motor coaches. At the present time, the most powerful motor coach engines have horsepower ratings of 150 or more. Each year more powerful engines replace the previous year's leaders, and the limit is nowhere in sight. How long will this steady increase in motor coach engine power continue? This is a matter of interest to all railways, whether or not they are operating motor coaches, since greater power in motor coach engines means ability to handle more passengers and greater capacity to move them with rapidity.

The overall lengths and widths of motor coaches are rather rigidly restricted by state laws, but the ingenuity of motor coach designers has made it possible to seat from 40 to 50 passengers in a vehicle the outside dimensions of which are within the law and surprisingly little larger than equipment carrying from 25 to 29 passengers. With more weight to move, motor coach engines have had to be of greater power. Furthermore, the necessity of meeting the public demand for speed in travel has made more imperative the demand for more power in the heavy modern motor coaches.

The trends in the development of motor coach engines make a story of particular interest to motor coach operators but of interest also to those whose business is affected in any way by motor coaches operated by others. The subject is treated authoritatively and in adequate detail in an article in this issue of the *Motor Transport Section*.

The Motor Coach Engine— Yesterday, Today, Tomorrow

By Carl Abell

THE history of motor coach engine design has been a story of the evolution of both size and detail of design to produce increased power. Greater power has been necessary for a number of reasons.

Competition among motor coach operators has brought about endless improvements in equipment—heating systems, improved baggage facilities, more adequate braking systems operated by power, various electrical installations requiring increased battery capacity and battery charging facilities, more and better upholstery, and an endless variety of lesser refinements to add to the "passenger appeal." All of these improvements and additions have increased the weight of the coaches.

Along with the increase in weight has come the requirement for higher coach speed, which follows naturally from the extensive improvement of streets and highways, the development of highway safety devices and traffic controls which facilitate faster driving, and the general speeding up of all traffic due to the improvements in automobiles which have given people the habit of driving faster both in town and on the open road. Since our population has grown accustomed to this increased rate of speed in private transportation vehicles, and since the rate of speed of the public service vehicle must at least approximate the speed at which the passengers are accustomed to travel on the highway, it naturally follows that the motor coach must speed up in order that the passengers may not be dissatisfied on account of delays.

Eight years ago, when vehicles especially designed for motor coach service were just beginning to appear on our highways, the accepted motor coach power plant had four cylinders, developed from 45 to 60 brake hp., and was capable of handling an intercity type coach at a maximum speed of 35 to 40 miles per hour. The standard intercity coach at that time was of the side-door type, with seats running clear across as in a sedan. It weighed about 8,000 lb. and the largest standard vehicles seated twenty-two passengers. Within two years the center aisle or parlor car type was developed, with a wider and longer body, individual seats, enclosed baggage boxes, etc., and these more attractive vehicles developed traffic over many lines to the extent that it became necessary to provide capacity for more passengers.

By this time the weight of the new type coaches had increased to above 12,000 lb. The necessity for increased road speeds was already beginning to be felt, and this with the greater weight and added wind resistance of the larger body made a large increase in motive power imperative. One after another the several motor coach manufacturers introduced six-cylinder engines designed to handle coaches weighing from 12,000 to 15,000 lb. empty, providing at the same time enough excess power to keep pace with the higher scheduled speeds of the vehicles. These engines provided an actual brake horsepower at the clutch of from 70 to 90, after deducting the power consumed in driving the generator, fan, air compressors and other necessary equipment. Again the evolution of bigger and better motor coaches increased the engine's load, and the extension of highway facilities, with the correlated factors affecting all vehicle speeds, made it necessary for the coaches to move faster. The vicious circle was again in action, and more power was again required.

Some manufacturers chose to ignore the condition for a time, but the activities of the more progressive designers in improving the power output of their engines soon forced competition to step into line. One manufacturer has actually accomplished the rather surprising feat of developing

105 hp. in an engine which had originally been considered outstanding when it developed 75, and this was done without raising the compression or increasing the displacement. The development was spread over a period of six years, a little at a time, as constant experimental work pointed the way to greater power. A number of competitive engines were developed to about the same power.

Even this amount of power has proved inadequate for the larger highway parlor cars which have appeared in the last two years. Taking the bull by the horns, at least three manufacturers have brought out new and larger engines which have an output of 150 hp. or more.

The most obvious phase of the evolution to today's motor coach engine has been this increase in power—first a 50 per cent jump from four cylinders to six of approximately the same bore and stroke, then a steady increase through refinements and improvements without significant changes in dimensions, and then another bold jump of 50 per cent in power, through a corre-

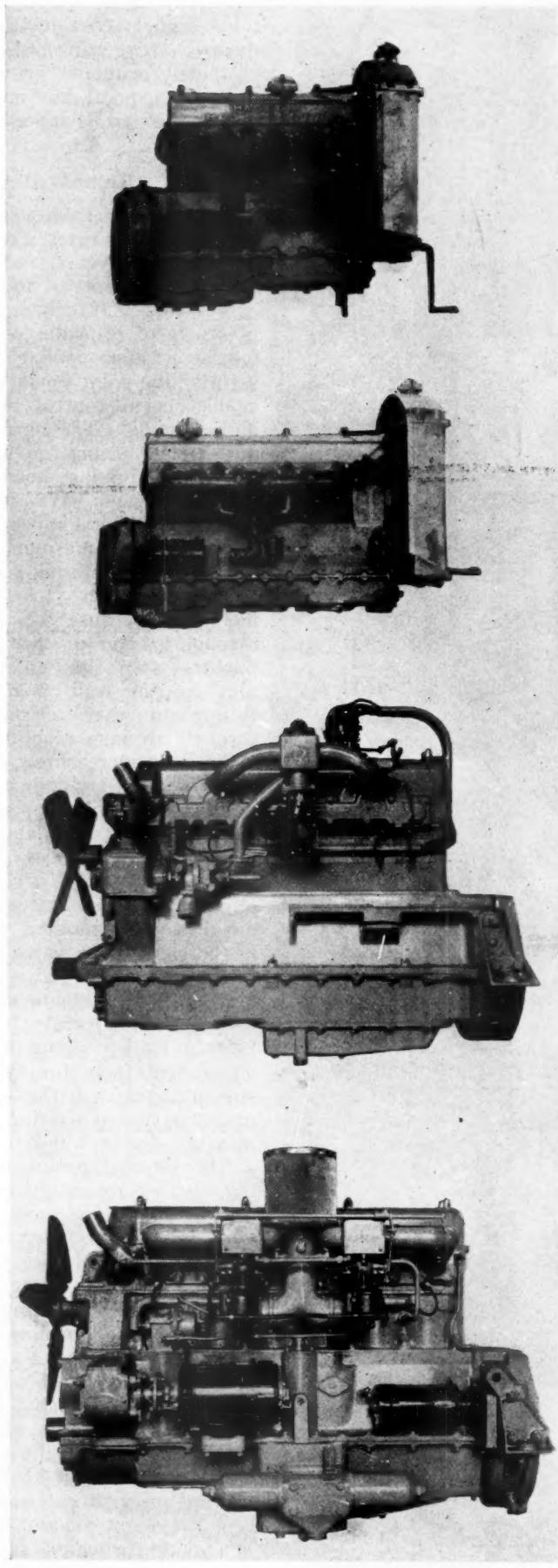
As remarkable as the changes in the outward appearance of motor coaches have been the changes in their engines. Engine designers have not found it easy to keep pace with the impatient demand for greater speed, more power. But there has been and still is in process a constant evolution in motor coach engines. The trends in engine design, past, present and future, are authoritatively discussed in this article. The author's prejudice, if any, is on the side of the operator of motor coaches, who has to pay the bills.—THE EDITOR.

sponding increase in displacement. Where will it stop? Will it ever stop?

The writer believes that, with a better understanding of the economic laws surrounding motor coach operation, we will finally arrive at the point where we can say, "For this condition, one hundred horsepower is best. For that condition over there, exactly so much more is necessary." But if history repeats itself as it has in the past, those conditions will shortly have changed, and more power will again be necessary.

The economics of the situation has two sides—that relating to income, and that connected with expense. The ability to "perform" on the road is a factor of first importance, because it is a vital element in attracting patronage. How long the engine will last, how much time is required for maintenance, and how much fuel, oil, and incidental supplies are necessary to provide this degree of performance, are the complementary economic phases which are figured on the debit side of the ledger. Along with the trend toward more power, engineers have created engines which are operating at lower cost. This may not be at once apparent, since operating costs per mile have steadily increased over the past eight years; but today's motor coach is twice as heavy as the coach of eight years ago, and today's mile is run at a much faster pace. Reduced to a common denominator of cost per ton mile, and operating at the same speed over the same road, the odds would be heavily in favor of today's engine.

This improvement in operating economy is in part due to better engine design, but the selection or development of more suitable materials has had a great deal to do with

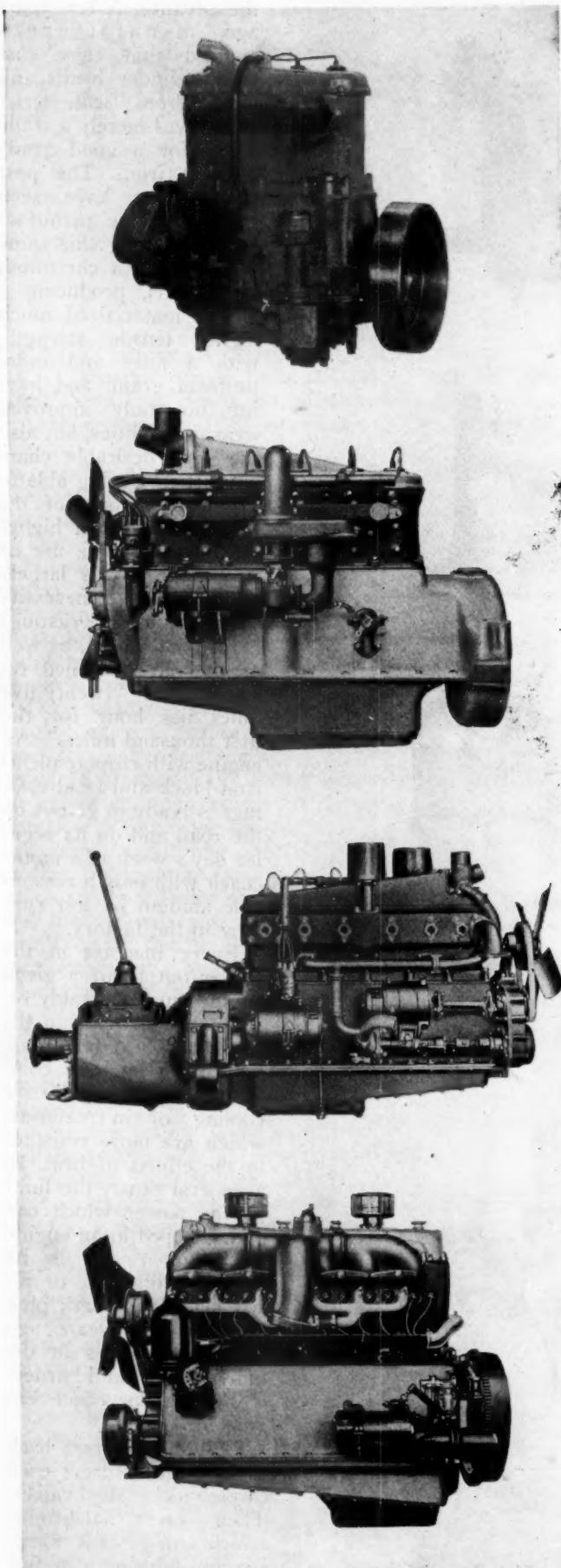


Steps in the Development of the Hall-Scott Motor Coach Engine from the Oldest (top) to the Newest (bottom)

the advance. A few years ago manufacturers boasted that they cast their cylinder heads and blocks from "semi-steel," which was merely a trade name for a good grade of cast iron. The past three years have seen more of these manufacturers alloying this same cast iron with chromium and nickel, producing a harder material of much higher tensile strength, with a finer and more uniform grain, and having not only improved wearing qualities, but also the very desirable characteristic of being able to resist the impact of the valves at a much higher temperature. The use of this material has largely eliminated the necessity for seasoning the castings before machining, as well as the old fashioned restriction to "twenty-five miles per hour for the first thousand miles." An engine with chrome nickel iron block and head castings is ready to go out on the road and do its regular day's work in a motor coach with only a reasonable amount of test running in the factory.

Every increase in the power output of a given engine must inevitably result in an increase in the amount of heat generated. This must have its compensation, either in better cooling, or in materials which are more resistant to the effects of heat. In a general sense, the limit of the power which can be developed in an engine of a given size is its ability to dissipate or resist heat. The spark plug of even five years ago would be useless in the more efficient and harder-worked motor coach engines of today.

Only a few years back most manufacturers used chrome nickel steel valves. Then came silchrome, which could resist warping and burning at a few degrees higher temperature, and by this narrow margin made it possible to



The Yellow Coach Engine, Past and Present

take higher continuous power out of an engine. Today we are getting valves made of alloys which are absolutely without "critical temperature" clear up to the melting point, and consequently they are free from warping at any temperature obtainable in a combustion chamber.

Improved Cooling Systems

Great strides have also been made in the cooling of engines. The water circulating system has been well developed for years, and seems adequate for the ordinary requirements of today, granted that it is properly engineered. Of course, there are limitations in the present type of water cooling, but beyond these limits we have vapor cooling by steam, and we also have high-boiling-point fluids such as "prestone," which will enable us to control temperatures through a much higher range. The normal operating temperatures of our engines cannot go up much higher than they are at present running, however, until lubricating oils are developed which have higher flash points and can withstand the higher temperatures.

In the meantime much can still be accomplished, in the matter of internal cooling, by the use of cold carburetion. Water jacket cooling is at best relatively inefficient, because the heat must first be transferred through a layer of carbon or oil, both very poor conductors, then through the highly resistant "surface film" of the wall, then through the iron wall, then through another resistant surface film, and finally through an insulating layer of rust and precipitates, which gets increasingly thicker as the months roll by. After passing through all these obstructions, the heat—some of it—finally passes into the water and is carried to the radiator, and then the process is repeated while the water loses some of its heat through the core into the air. In cooling valves and pistons, it is obvious that the heat must be transferred from one metal part to another, with only intermittent contact in the case of the valve heads, and through an oil film in the case of the valve stems and pistons. The evaporation of the gasoline absorbs a large amount of heat, and it is much more logical to put this appetite for heat to work cooling the engine, rather than to take waste heat from the exhaust and run it through the engine again with the fuel in order to bring about a preliminary vaporization which is not only unnecessary in a hot engine, but is quite wasteful.

The internal cooling idea has been worked out in one highly successful motor coach engine, which operates without appreciable dilution of lubricating oil even with the fuel mixture passing the valves at a temperature of less than 40 deg. Any good motor coach engine, if equipped with suitable pistons and rings, and a device for accomplishing a reasonable degree of atomization of the gasoline and its admixture with air, could operate within a safe margin of dilution throughout the greater part of the year, with no warm air intake and no hotspot in the fuel induction system. Rail-car engines are now operating satisfactorily on 38 gravity fuel oil, the fuel mixture passing the valves at temperatures of 40 deg. F. or even lower, with no heating prior to entering the combustion chamber except the slight amount which is unavoidably absorbed in passing through a few inches of water-jacketed intake passages in the head. This reference is given merely to corroborate the statement that, with proper precautions in design, crankcase oil dilution can be reduced to a negligible factor, and should not be mis-

understood as even suggesting that any form of heavy fuel is satisfactory for the operation of a motor coach. It is true that a few coaches are being run on low grade fuels, but the writer is far from convinced that the supposed economy of fuel is not more than overcome by increased cost of maintenance, and it seems almost certain that the loss of patronage and good will through the sacrifice of power and speed and the increased tendency to produce vile-smelling exhaust fumes will react negatively as far as revenue goes.

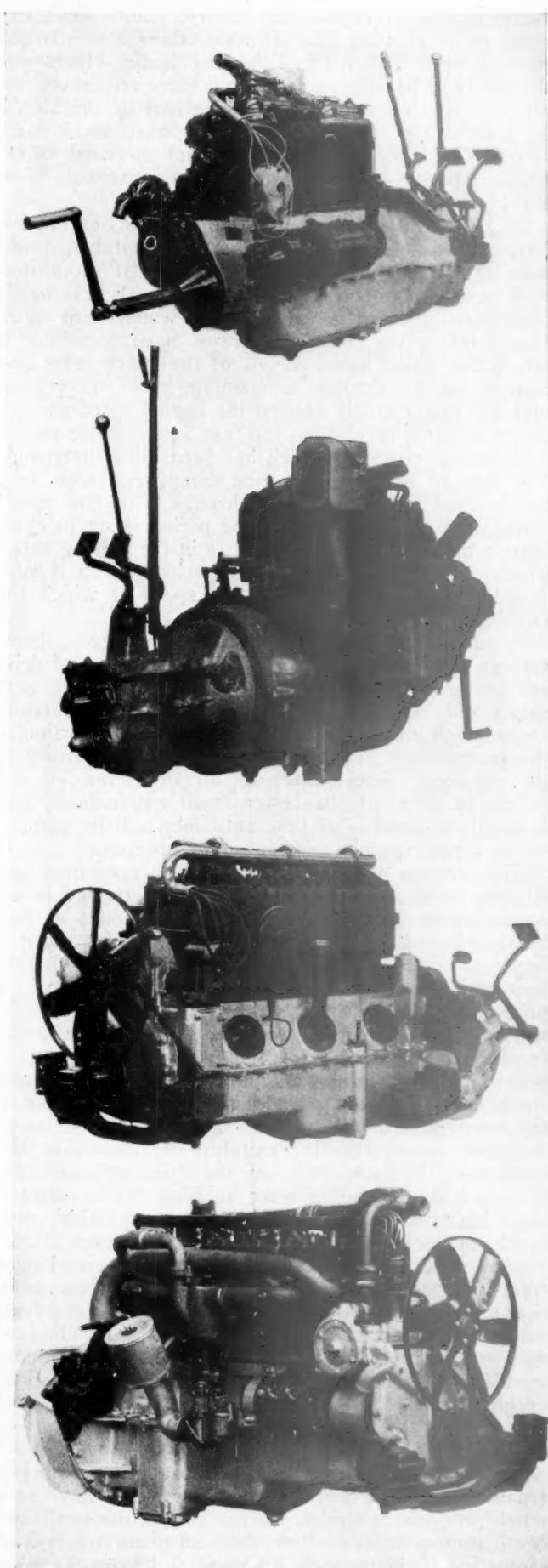
Aluminum Alloy Pistons

An additional feature which promotes better cooling, and which is now included in practically every motor coach engine, is the making of the pistons from aluminum alloy, which has a much higher conductivity than cast iron. Full advantage is taken of this characteristic, since it is necessary to design these pistons with very thick heads, and to join the heads very strongly to the wristpin bosses in order to make them withstand the severe strains of motor coach engine operation. The improved conductivity provided by the inherent nature of the material and the mass in the pistons, dissipates the heat absorbed by the heads through the water jacket, connecting rods, and the air inside the crankcase. This holds the piston temperature low enough to reduce the amount of carbon formation on the upper surface of the heads, and in many cases it eliminates the coking of oil on the under side of the heads. The first condition extends the period between carbon removals, thus holding down the maintenance expense, while the second reduces the deterioration and the consumption of lubricating oil.

It is quite obvious that there is an advantage in cooling the lubricating oil of an engine which is working hard and running hot. This is particularly true in the case of overhead-valve engines, which pass more or less oil over the heated cylinder heads. Aluminum lower crankcases, which radiate the heat from the oil sump into the air, are almost universal in motor coach engines, excepting, of course, those which were adapted from engines produced primarily for use in automobiles or light trucks in highly competitive price classes. In at least one case, we find a manufacturer supplementing the aluminum crankcase with a special oil cooler, through which the water from the bottom of the radiator is pumped on its way to the cylinder block.

We have also seen a great deal of development in the balancing of moving parts and in the elimination of destructive forces in the engine. Most manufacturers pay a great deal of attention to the careful selection of balanced sets of pistons and connecting rods, so that any given engine will run smoothly in so far as unbalance in reciprocating parts is concerned. One manufacturer has gone so far as to make all pistons of exactly the same weight, and all connecting rods are brought to the same weight and identical centers of gravity, within limits which are not attainable in most factories. The machine tools investment in the connecting rod lineup in this particular factory is more than a quarter of a million dollars, but users of these engines have a very much simplified service problem in connecting with rods and pistons. A complete interchangeability is secured—any connecting rod, or any connecting rod cap, will interchange with like parts in any engine of this make and model so that the balance of the reciprocating parts is permanent and absolute.

The designing of crankshafts is still one of the



Steps in the Development of the Mack Motor Coach Engine

battlegrounds of engineering theory. Some designers seem to be striving for stiffness, others for enlarged bearing area and reduced bearing loads, others for durability of bearing surfaces, and there are, of course, all sorts of variations and combinations of the above. In general, the trend seems to be toward seven main bearings, counterbalanced shafts, and torsional vibration dampeners of one type or another, particularly in the larger engines.

A great deal is still being found out about the behavior of large shafts embodying these features—problems are arising which seem quite out of proportion with results obtained in smaller shafts. It was never anticipated that these large shafts would turn more than 2,000 r.p.m., but many cases have come up in which the driver has used one of the lower gears and stepped on the throttle to maintain speed on grades, and has unknowingly carried the engine speed up five or six hundred revolutions too fast, into a major period of torsional vibration which has been quite disastrous. The type of torsional vibration dampeners most commonly used is effective only through a narrow speed range, and the tension or spring period is set to eliminate a minor period which occurs in the driving range of the engine, while the major period, which is supposed to be above the operating speed at which the engine will be run, is unprotected.

A number of cures for this condition suggest themselves: More careful training and supervision of drivers, the use of transmissions with several more gear ratios, and the development of torsional vibration dampeners which increase their effectiveness in proportion to the increase in r.p.m. of the engine and the intensity of the vibration. These latter are already developed and in use in some of the better small automobiles, and it is only a question of time until they will be adapted to the larger engines used in motor coaches.

The problem of crankshaft size is an open question. Rigidity is highly desirable. It can be attained to an equal degree either by using a large amount of less highly alloyed and heat-treated steel, or by using a lesser amount of specially alloyed and more highly heat-treated steel. The centrifugal forces set up in an uncounterbalanced shaft revolving at high speed are terrific, and they increase with the square of the radius of the circle described by the rotating throws. To relieve load on the bearings imposed by this centrifugal force, counterweights are added. The larger the shaft, the heavier the counterweights must be. As the rotating mass increases, the flexibility of the engine decreases—it becomes slow on the "pick-up" and decelerates slowly during gear shifting. The smaller, more highly heat-treated shafts with equal rigidity give much more satisfactory engine performance, lower "deadweight," lower fuel consumption, and give longer wear than softer and larger shafts. They are more difficult and expensive to machine, but the use of recently developed cutting-tool materials is tending to equalize the production costs, and we may expect more manufacturers to go downward in the weight of their crankshafts.

Better Bearings

Bearing failures are among the most serious of maintenance problems, and the past few years have seen much progress in engine bearing design, materials and installation practices. Practically all manufacturers of motor coach engines now line bore and ream the main bearings to size, with proper oil film clearance all

around. Gone are the days when bearings were fitted tight to the shaft by hand scraping, and then shimmed out to allow oil film clearance at the top and bottom with none on the sides. Steel-backed babbitt bearings have made their appearance, and the copper-lead alloy bearings, uni-metallic from front to back, has been used for nearly two years on the most severe motor coach operations in the United States, with a performance record that is little short of incredible. This metal gives evidence of being able to resist greater bearing loads than previously used materials, without pounding out.

The problem of cost of maintenance has been attacked from two angles; first prevention or reduction of wear, through such means as oil filters and air cleaners, the minimizing of crankcase dilution, and the use of wear-resistant materials. Hardened nickel-steel gears and alloy-steel small wearing parts are now the rule instead of the exception. Gear faces, sprockets, chains, pumps, driving shafts, etc., are increasing in size, and most of these parts are made of stronger materials.

Some gains have been made but enough has not yet been accomplished toward the second angle of the maintenance problem—simplifying replacements, and the elimination of excess labor costs connected therewith. Too many details of construction have been inherited from automobile practice, which are not ideally suited for revenue service where losses due to "time out of service" are serious factors of operating cost.

The features in question are probably justifiable in mass production automobiles which are up against severe price competition, and which are seldom subjected to the equivalent of a motor coach operator's "major overhaul" while in the hands of the original owner. In the case of the motor coach, the first cost is only a small fraction of the cost of keeping the coach operating throughout its life. Before it is finally relegated to the junk heap, the motor coach engine probably requires several sets of valves, pistons, rings, and wristpins, three or four changes of bearings, the shaft may be ground two or three times, the block must be reground or replaced several times, and so forth almost without end.

There is no justification for designing an engine so that it is necessary to remove much equipment to get at parts requiring regular maintenance work. Nor should it be necessary to remove the radiator and a lot of other parts in order to change a timing chain or reset the valve timing, since one manufacturer showed us nearly 10 years ago how it could be done merely by removing a hand hole plate. Nor is it reasonable that a cylinder block should cost nearly \$300 for replacement, when it is known in advance that it must eventually be replaced at some time on account of cylinder wear, to say nothing of valve seat wear in the case of the "L" head engine; and the ever present danger of cracking, which is likely to occur in any engine. One manufacturer sells a new block and set of completely assembled pistons for a six cylinder engine for less than \$100, and removable cylinder barrels have been practical ever since we learned how to seal them against water leaks several years ago. They are now used to a limited extent in motor coach engines.

Overhead Valves

Three of the leading engine manufacturers now use the overhead valve design. This feature may or may

not be an advantage from the standpoint of ultimate maintenance economy, depending upon the design of the head and the operating parts. Certainly there can be no argument about the greater ease and speed of reconditioning the valves as a bench job, rather than to require the mechanic to labor under the disadvantage of sitting on or reaching over a fender, and doing his work in as awkward a position as it is possible to invent.

However, the greatest potential advantage of the overhead valve design lies not in convenience or economy of maintenance, but rather in the opportunity it offers the designer to apply more efficient manifolding, giving the fuel mixture a more direct path to the cylinder, and carrying it downward instead of up and over in passing the intake valves. This enables the skillful designer to hold the torque peak practically flat through a range of several hundred r.p.m., covering practically the entire accelerating range, instead of falling off rapidly from a peak which occurs at a relatively slow speed. Not all manufacturers of overhead-valve engines have correlated the various factors of carburetion, manifolding, valve timing, etc., to achieve this point, but once again the fact that it has been done proves that it is possible. This prolonging of the period of high torque provides a decided performance advantage in enabling the motor coach to accelerate much more rapidly, to climb hills at greater speed, and to accelerate more rapidly at high speed, when this extra "wallop" is needed to overtake other vehicles. The lack of this accelerating ability at high speeds makes the old-type, heavy-duty truck engine forever unsuitable for use in motor coaches, or, for that matter, in trucks which must maintain high speed schedules.

Another advantage of the overhead valve engine is the compactness of the combustion chamber, which is inherently less liable to detonation than the combustion chamber forms in which the flame must travel over a greater distance. This makes it possible to use slightly higher compression ratios than in the other types of head, and to get a little more power in a given displacement.

What Next?

A review of the trends which have resulted in the development of the motor coach engine of today leads naturally to a consideration of what we may expect in the engine of tomorrow. There is no reason to believe that we have now reached—or that we shall ever reach—the zenith of the demand for power. Just as we see in railroading that the economics of the situation call for constant improvements in roadbed, rolling stock and motive power, to make it possible to move heavier loads at greater speeds, so we see in highway operation that the same economic forces are at work. These are aided and abetted by the demands of the great body of passengers who are year by year becoming more accustomed to a higher average speed in automobiles.

Increased motor coach speed can be achieved in two ways—by lessening the resistance to speed imposed by weight, friction, and wind resistance, or by a still further increase in the power output of the engine. Advances will undoubtedly be made in both directions.

How is this increase in power going to be obtained? Will we get it by increasing the efficiency of our present engines, or by building new engines of larger size? There are certain advantages, and

certain disadvantages, in each process. Either way we proceed, we are matching force against material, desires against limitations. But the limitations of today will not be the limitations of tomorrow.

There are naturally two opposed schools of thought in this matter—those who believe in the ultimate economy of the large engine turning over slowly, with all power transmission parts massive, and those who are of the opinion that the ends of economy will be better served by the use of a smaller, more efficient engine, operating at a higher speed, with a corresponding reduction in the weight of the engine and all power transmission units back to the final reduction.

In railroad practice, the development of efficiency in prime movers appears to be overshadowed by the tendency to go up in size as additional power is required. In automobile practice, the tendency seems to be in the opposite direction; power plants are becoming lighter in weight, more efficient in any given speed, and capable of operating satisfactorily at higher speeds. The improvements in materials and design which have made practical the high speed, high power automobile engine of today are being embodied in motor coach engines. In fact, coach engine materials are on the whole much better than those utilized in ordinary automobile production.

In one notable particular, however, the motor coach engine is behind the times. A relatively large increase in power is obtainable through the use of high compression ratios, and the writer has so far seen only specially equipped motor coach engines which fall in the high compression class. The slow progress in this direction is no doubt due to the fact that operators are inclined to think of their fuel cost in terms of cost per gallon, whereas the true index of fuel cost is cost per mile. A high compression engine operating on non-detonating fuel presents several distinct advantages over the lower compression engine operating on plain gasoline. An increase of from 15 to 20 per cent in brake horsepower could readily be obtained in most motor coach engines by this simple change. By lowering the rear axle gear reduction so that the driving torque on the wheels will remain the same as with the low compression engine, the fuel consumption will decrease in direct proportion, equalizing the fuel cost or even showing a saving. At any given vehicle speed, the engine speed would be reduced, as would likewise be the case with all driving mechanism clear back to the final reduction. This would naturally result in a lowering of the cost of maintenance of both the engine and the power transmitting parts.

The equal distribution of the fuel to the cylinders offers serious problems, particularly in the large engines now being built. With the present carburetion systems, it is inevitable that a certain amount of liquid fuel in coarse drops must be carried through the manifolds, and under this condition it is absolutely impossible to serve all cylinders with an identically proportioned mixture. Dual manifolding helps, by shortening the path of the fuel mixture, but it introduces two carburetors, which must be kept synchronized to be fully effective. Downdraft carburetion is also a material aid in evening up the distribution.

While excessive hot-spotting results in a more complete vaporization, and consequently more even distribution and smoother operation, the heating up

(Continued on page 410)

What Makes a Good Garage?

WITH the statement that all of the problems concerning the proper design of garages for economical maintenance and operation of motor coaches cannot be definitely answered in a single report, due essentially to the fact that no two companies have exactly the same type of operation, the way and structures committee on motor coach garage design of the American Electric Railway Engineering Association, at the recent annual meeting held in San Francisco, submitted an outline of important points to be considered when developing plans for a garage.

In preparing the outline the committee has taken into consideration the fact that an operating garage should be so designed and equipped as to provide satisfactory working conditions for three distinct functions of the operation, these functions being: (1) transportation, (2) maintenance, and (3) personnel.

Outline of Motor Coach Garage Layouts

Site

Location for minimizing transportation costs

1. Two street frontages if possible
2. Dead mileage to be a minimum
3. Accessibility to personnel

Location for most economical delivery of materials and fuel

1. On railroad siding

Architectural Features of Building Proper

Area to be as free from columns as possible.

1. If columns are used, spacing should be such as to permit easy handling of coaches
2. Draft curtains required by some local ordinances and fire inspection rulings

Estimated capacity for all purposes, except transportation and personnel, may be computed on the basis of 400 sq. ft. per coach of the 40-passenger type.

Location of transportation and personnel activities

1. All of these functions should be on the ground floor unless ground area is too valuable
 - (a) Two story garage may increase insurance cost
 - (b) Personnel will not climb stairs to make greatest use of facilities provided for their convenience
 - (c) Instruction rooms are an exception to section (b) and may be placed almost anywhere

Entrances and exits

1. Arrange and locate to cut down shunting or backing to minimum
2. Dispatcher's office should be so located as to give best supervision of incoming and outgoing coaches
 - (a) This depends on local system of operation
3. Entrances and exits should not block each other
 - (a) Free exit at all times for road emergency
 - (b) Free exit at all times for snow equipment
4. Emergency exits for use in case of fire
5. Details of doors
 - (a) For single doors, width should not be less than 14 ft.
 - (b) Power operated
 - (c) Remote control

Unobstructed area

1. No columns if possible
2. If columns are necessary, the maximum possible spacing should be provided
3. Double-deck garages require columns in lower level. Such garages are economical of ground area and may be desirable where real estate values are high

Height of ceiling and roof

1. Clear height of twelve feet minimum for building economy where double-decks are not planned

Fire protection

1. Sprinkler systems

2. See recommendations of National Fire Protection Association

First aid supplies

Proper drainage for all portions of floor

Location of Building on Site

Forecourt or side yard is desirable

1. Purposes

- (a) To prevent obstructing streets during pull-in
- (b) Coaches can be warmed up in yard to reduce fumes in garage

2. Specifications

- (a) Should be as nearly level as possible consistent with proper drainage, so that coaches may be left without an attendant
- (b) Size of court or yard
 - (1) Depends on cleaning and fueling facilities at entrance
 - (2) Approximately 10 per cent of area of building

Garages are being outgrown constantly, so it is recommended that vacant ground be allowed around building to provide for expansion.

Heating and Ventilation

Adequate heat to be provided at all times

1. 70 deg. in offices
2. 60 deg. in working area of garage
3. 60 deg. in storage area of garage
 - (a) The above figures apply with doors closed

Ventilation is of most importance around pits and in work area

- (a) Good ventilation engineering advice is essential
- (b) Adequate change of air must be provided

Lighting

Storage floor lighting

1. Skylights and windows
2. Artificial illumination
 - (a) Lighting at night should be such that shop efficiency is equal on both day and night shifts
3. Light color wall paint

Pits or work areas

1. Natural lighting
 - (a) Skylights and windows
 - (b) Windows opposite open ends of pits
2. Artificial lighting
 - (a) Light intensity at night should be such that shop efficiency is equal on both day and night shifts
 - (b) Greater intensity and more fixtures than in storage area
 - (c) Permanent fixtures should be arranged in pits
 - (d) Extension cord outlets
3. Light colored walls are valuable in producing efficient work
 - (a) Pit walls
 - (b) Places easily soiled

Details to be Considered in Layout of Garages

Transportation dispatcher's office

Receiver's office for transfers, change, etc.

Storage for fare box magazines

Area for pulling magazines and taking register readings

Provide office for disciplinary purposes

Quarters for operators

1. To be in full view of dispatcher's or receiver's office
2. Drinking fountain
3. Full length mirror
4. Space for making out accident reports

Space for bulletin boards

Space for schedule boards

Location for assignment boards

Driver's wash room and locker room

Personnel activities if desired

Driver's instruction room

Fuel and engine oil filling station

1. Outside location preferred

Tire carcass inspection

Exterior cleaning

Interior cleaning

Nightly minor inspection

Storage of coaches

1. Provision for air lines

2. Provision for extension cord receptacles in walls or columns

Maintenance work area

1. Chassis and parts cleaning

(a) High pressure spray or steam
(b) Hot cleaning solution vat

2. Greasing pits

(a) Piped for grease and oil drainage

3. Inspection pits, racks or ramps

4. Brake testing machine

5. Repair pits

6. Foreman's office

7. Stockroom

8. Portable tool storage

9. Repair equipment and tools

(a) Work benches, etc.

10. Mechanics' tool lockers or drawers

11. Crane facilities of 2,000-lb. capacity

12. Pit jacks for lowering heavy units

13. Air compression apparatus

14. Oil reclaimer

(a) For 100 or more coaches

15. Scrap and waste storage and disposal

16. Storage battery shop

(a) Acid proof floor(b) Separate plumbing, acid resisting

17. Headlight adjusting target

Gasoline storage and pumps

Oil and grease storage and pumps

Tire service and storage

Water heating plant

Heating plant

Fuel storage

Service car storage

Snow fighting equipment storage

Snow fighting material storage

Mechanics' clothes lockers and wash room

Drinking fountains

Location of Work Areas

Fueling, oiling and washing arrangements may be performed near entrance

1. Number of work lines and entrances required
 - (a) Dependent upon rapidity of pull-in
 - (b) Dependent upon size of forecourt or outside storage
 - (c) Dependent upon washing program
 - (1) Daily at night
 - (2) Every three days during daytime
2. Center to center distance of lines should be about 15 ft.
3. Arrangements of gas and oil filling stations
 - (a) Wet hose arrangement (nozzle control)
 - (b) Hose to be as short as possible for rapid handling
 - (c) Gasoline filling capacity should not be less than twenty coaches per minute.
4. Exterior cleaning
 - (a) Spray racks are preferable
 - (b) Other cleaning methods
5. Space after wash rack for draining and window squeegeeing
6. Space for interior cleaning

Arrangement of storage area

1. Storage area arranged so that minimum amount of shunting is required during pull-in and pull-out

Location of inspection pits

1. Availability under following conditions
 - (a) Day
 - (b) Night
 - (1) Garage half full
 - (2) Garage full
 - (3) Location should be such that they are blocked as little as possible by parked coaches
2. Clear of wash rack area
3. Free of drafts from doors

Number and size of pits

1. Width such that pit boards are unnecessary
2. Length of entire coach
 - (a) Not less than 30 feet
3. Center to center distance not less than 11 or over 15 ft.

4. Angle iron curbing on edges
5. Open-end arrangement and low level work bench
6. Number of pits for inspection and maintenance work, including greasing
 - (a) Five per cent to ten per cent of coaches housed, according to inspection system
7. Ventilation of pits

Number of brake testing machines

1. One needed for every 100 coaches

Arrangement and number of greasing pits

1. Pits piped to handle all lubrication work without use of portable apparatus
2. One pit needed for each 100 coach garage

Chassis cleaning ramp or pit

1. Under carriage open to high pressure spray

Location of foreman's office

1. Adjacent to pits and stock room
2. Work benches and pits to be visible from windows of foreman's office

Stock room

1. Location

- (a) Adjacent to pits and foreman's office

Size

- (a) Area in square feet to equal four times number of coaches times number of types or distinct models of coaches
- (b) Thirty per cent of floor area of stock room covered with balcony for lightweight bulky parts

Gasoline Storage

National Fire Protection Association regulations

Oil and Grease Storage

In garage

1. National Fire Protection Association regulations

Underground

1. Power delivery
2. Proper identification for intakes of each tank
3. To be no closer to passenger-carrying railroad tracks than allowable under Railroad Rulings of 1925

Tire Service and Storage Room

Six sq. ft. of space per coach serviced

1. Balcony also needed

* * *



A Boston-Portland Motor Coach of the Boston & Maine Transportation Company

Give The

Cooling System

Proper Attention

*To prevent overheating, the radiator and cylinder block must be kept free of rust and sludge—
Cleaning method suggested*

By Wm. H. Wilson

Research Engineer

OF the many problems confronting maintenance men few are more irritating than those which center on the cooling systems of the units under their supervision. Steaming radiators, frequent oil replacements, and lost operating hours add up quickly and show too prominently in the red to be considered with equanimity. Like most other ailments of commercial automotive equipment, there is a cure for the overheating trouble, providing the design of the cooling system is such that its tendency to overheat was not drawn on the original blueprints.

Seat of the Trouble

Before a remedy can be suggested, it is necessary to locate the seat of the trouble. Overloading will materially contribute to overheating troubles. Some commercial car manufacturers, in their efforts to establish a high pay load rating for their vehicles, undoubtedly impose too great a load limit on their power plants, with resultant overloading which in turn causes overheating. However, much has already been said and written concerning the dangers and delays which result from over-

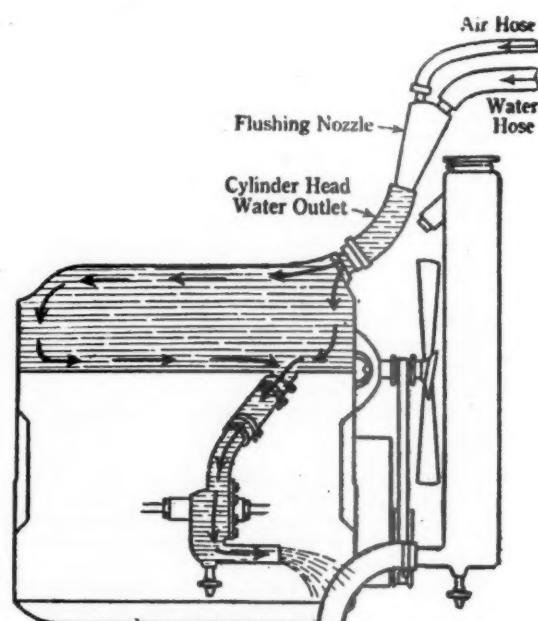
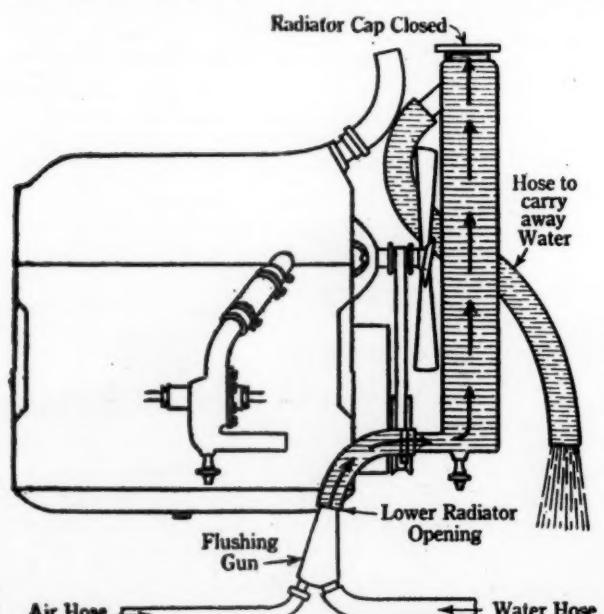
loading, without materially lessening the practice, so we will consider the more practical maintenance problems as they apply to existing conditions.

Although there are about 50 causes of overheating, only 8 or 10 of them are traceable to the cooling system. For the purpose of this article, we will arbitrarily assume that the timing, lubrication of the engine, the transmission, the brakes and all other parts, except the cooling system, are in normal operating condition.

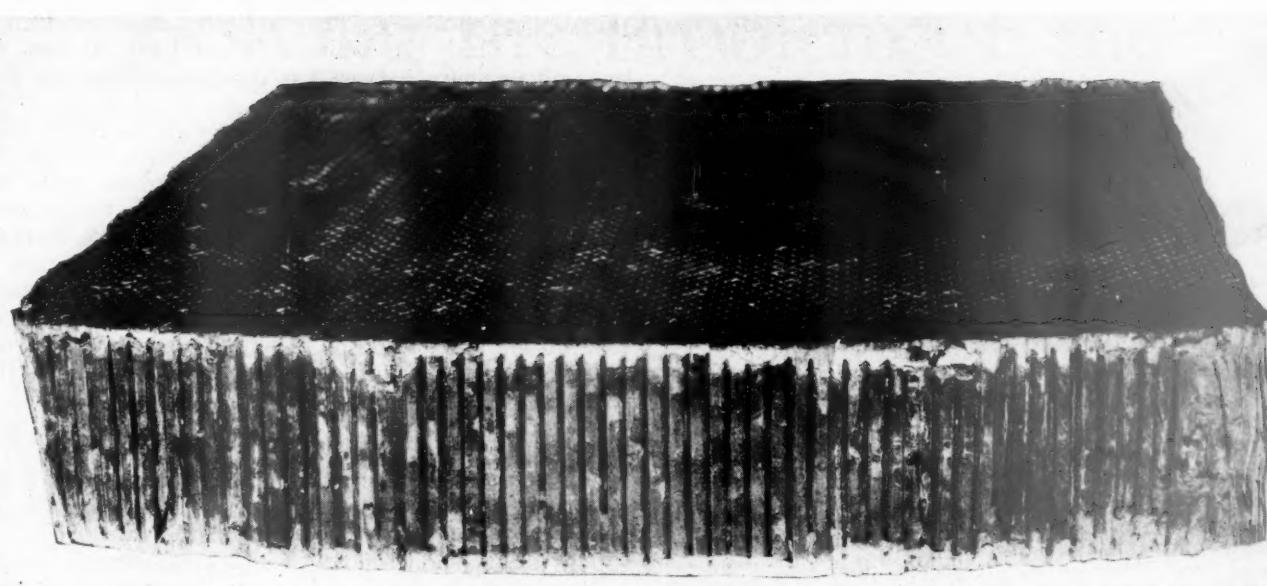
Keep Cooling System Clean

The fundamental need is to keep the cooling system clean and leak-tight so that it may function at the same pitch of efficiency its designer intended it should. Since most automotive cooling systems are designed to run very close to their cooling capacity, it is essential to exclude at intervals the rust and other restricting agents that form within.

Rust is the greatest single factor in cooling system overheating, both in commercial vehicles and in passenger cars. The cure, therefore, for most overheating



For Thorough Cleaning a Stream of Water Must Be Vigorously Circulated in a Direction Contrary to the Normal Water Flow



If the Radiator Is Not Cleaned Occasionally the Water Space Will Become Filled With Rust and Sludge

trouble is the removal of the rust from the cooling system and the application of effective maintenance operations which will prevent more rust from lodging in the water passages and the radiator. It is not a difficult undertaking and its small cost is more than offset by the resulting reduction in traffic delays and overhead expense.

Among the other factors which contribute to restricted circulation in the cooling system and to overheating are: scale, sludge, particles of rubber from worn hoses, impurities, foreign matter in the water used, and grease from the water pump.

Rust Caused by Air in System

Rust is formed by the action of air and water, in combination, on the iron and steel parts of the cooling system, the greatest exposed areas of which are in the engine block. Thus most of the rust found in a dirty cooling system is formed in the block. Rust does not form in the radiator core, but is carried there by the action of the water.

Two vehicles which are driven about the same distance and under about the same conditions will sometimes produce different quantities of rust, the amount formed being largely determined by the quantity of air will be drawn into the water passages by the action of fast driving or improper maintenance. The more air, the more rust, and it is obvious that the faster a unit is driven, the more air is sucked into the cooling system.

Air is present in that portion of the top radiator tank not filled with water and it is drawn into the cooling system solution by various means. If the water level is low enough to expose the top of the radiator core, air will be drawn into the water passages by the action of the water pump. As air is sucked out of the top tank, it is replaced by a rush of air up the overflow pipe. If the outlet of the upper water line from the engine is above the solution level in the top tank, a cascade is formed which drives air into the water stream. Air can also be sucked in directly at the water pump. Quite often a small water leak at the packing nut which is only slightly noticeable when the vehicle is standing, becomes a source of aeration when it is in

motion, the suction of the pump being sufficient to draw air through the leak. Thus, no water is lost while the car is in motion, but air is mixed with the water stream causing greater rust formation.

Rust also forms while engines are being dismantled in the shop. Throughout a valve grinding job, for instance, the head is off and the damp water passages are exposed to the air.

The Cause of Gum in Radiators

In service some radiators have become clogged with a gummy substance, the source of which could not be readily determined. This gum has been blamed for many things, anti-freeze solutions when possible, but usually it is a mixture of rust and grease from the water pump.

A grease gun filled with ordinary chassis lubricant should never be used on a water pump. If the gun is loaded with a good, reliable waterproof grease and moderate pressure is used, no trouble will result. Lubricating grease, other than waterproof grease, is not intended for water pump service since hot water will soften it and cause it to run into the cooling system, where it contributes to clogging by lending itself as a binder of rust.

Hard Water Causes Overheating

Another clogging agent is lime or other impurities in the water used. These are not as important as rust and grease, but nevertheless they play a part in radiator maintenance.

A formation takes place in the water jackets of the motor, especially if hard water is used, which is aggravated if frequent replenishments are necessary because of leakage and evaporation. Naturally, as the passages in the radiator core are very small, restricted flow will result and cause overheating. Deposits of rust, sludge and scale also settle in the water passages of the engine block and form an insulation which retards rapid cooling.

Pressure flushing in a direction contrary to the normal water flow in the system is the only manner in which a cooling system can be efficiently cleaned. We



Scored Water Pump Shafts Result from Lack of Lubrication or from Excessive Tightening of the Packing Gland

have seen that rust, scale and sludge deposits are built up by the action of water driven by the pump. It has been found that the cooling water may move with a speed as high as 55 ft. per second inside the system when the vehicle is on the road. To dislodge the rust a volume of water having a greater velocity than that produced by the circulating pump under operating conditions, must be used.

Pressure flushing is, therefore, necessary and is accomplished by forcing a sufficient stream of water through the cooling system, in a direction opposite to the regular flow, by spurts of compressed air.

Every garage has compressed air and water and the only tool needed is a flushing gun. This tool costs little but makes the work of pressure flushing a simple job and saves time as well. With one of these tools, the man on the wash rack can do a pressure flushing job in from 30 to 45 minutes on most trucks or motor coaches. Besides the compressed air and water, a gallon of kerosene oil and either a good radiator cleaner or a solution of washing soda should be available.

Pressure Flushing Procedure

The first operation in pressure flushing is to remove the lowest hose connection and open all drain cocks. The rush of water through the opened hose will help to carry away some of the rust and sediment which has collected. Close the drain cocks, and reassemble the hose after the system is drained. Pour a gallon of kerosene into the empty system and fill with water. Allow this mixture to circulate through the cooling system for 20 min. with the engine running and a cover over the radiator. Drain the kerosene by removing the lower hose and opening the drain cocks.

Next, either a standard radiator cleaner or a solution of $\frac{1}{2}$ lb. of washing soda to each gallon of water should be used to fill the system. Care should be taken not to pour a cold solution into a hot engine. Start the engine and run it for 20 or 30 min. with the cover again in place. Drain the system in the same manner as before and disconnect the upper hose, thus disconnecting the radiator from the block.

Apply the air and water injector at the lower hose connection of the radiator. In cellular radiators not more than ordinary tire-inflation pressures of air should be used. But in heavy duty truck radiators there is little danger of bursting the radiator with too much air

pressure, particularly when the upper hose connection is open. Flush the radiator for at least 10 min. or until all evidence of rust has disappeared and the exhaust stream runs clean.

Reverse the air and water injector to the upper hose outlet of the engine block and flush down through the water passages and out through the lower water intake, contrary to normal flow. Continue the process until the exhaust stream is clean. Water line thermostats, if any, must be removed during this operation.

Although the total time given here amounts to about one hour, the service man is free to do other jobs about half of the time, since he is not needed while the engine is heating up and circulating the kerosene or the soda solution.

Rubber Hoses Should Be Examined

It is best to inspect the rubber hoses at this time, since they frequently disintegrate very badly on the inside before any evidence shows on the outside.

The frequency with which this cleaning job should be done depends almost entirely on the number of miles the vehicle is driven in a given period of time. To keep cooling systems entirely clean they should be flushed about every 5,000 miles.

It has been conclusively proved by those interested in this research that the truck cleaning methods must be vigorous to prove effective and the method outlined has been tried time after time, in cooling systems in all stages of disrepair, with satisfactory results.

Of course, if the radiator itself is badly clogged in the beginning, it may be necessary to remove it from the frame and give it special treatment. If this is done, the engine block should be cleaned as well, since it is in the block that the main rust and scale deposits are located.

* * *



Front View of Mack Model BK

Solving the Problem of the Unprofitable Train

How one road studied its service and traffic to determine advisability of replacing steam train service with rail cars and motor vehicles

MOST, if not all, railways which have substituted motor vehicle service for steam train service during recent years did so only after careful study of the conditions surrounding each individual operation. Before establishing motor vehicle service, these roads gave careful consideration to the existing train service, the traffic being handled upon it, the traffic being handled by competitors operating on the highways, the probable cost of the substitute service proposed, and the possibility of the recovery through such substitution of traffic which had been lost.

It has been a common thing among railways which have substituted motor vehicle service for train service to spend many months in their investigations before proceeding with any replacement moves. Frequently railways have assigned committees of officers who have spent their entire time over an extended period in the study of their own situations and of the ways in which similar situations have been met by other lines. It has been found that too many considerations are involved to enable the question of whether or not motor vehicle service should be adopted in replacement of train operation to be passed upon before a sound basis for the decision has been furnished through careful study.

Different railways have used different methods to determine whether or not they should effect such substitutions. Each has directed its investigation along the lines indicated by its own individual problem. In the thoroughness of their study of existing service and competition and of the possibilities of saving operating expenses or increasing traffic, however, these investigations, having as their purpose the solution of the problem of the unprofitable train, have been alike.

One railway, typical of many others, did not confine its investigation to individual districts or branch lines, but made a careful analysis of its entire system. The points which it considered, the manner in which it carried on its investigation, the method of arriving at its conclusions, and some of the conclusions themselves may be of interest to railways which have not yet engaged in studies of this kind.

The road referred to centered its investigation first upon each division and then upon the groups of divisions in each district. First of all, an analysis was made to show the comparative railway and highway service on each division and in its vicinity. In this analysis the situation was determined with respect to each operating district in the division, and the first step was to set down the railway service and traffic over each such district. With respect to passenger train service, the officer in charge of the investigation received reports from divisional officers showing train numbers and the time of arrival and departure of these trains at each end of the district under consideration. Likewise, a description of the way freight service was obtained, this showing the

frequency of such service, the number of tons of l.c.l. freight unloaded daily in each district, the stations at which merchandise setouts were made, and the average number of tons of freight in each car set out. The description of the through freight service included the frequency of such service, the names of stations at which merchandise setouts were made, and the average number of tons of freight in each car set out.

The next step involved a study of the highway service parallel to each operating district, and the first point considered was the nature of the surface of the highway paralleling the railway line. Competitive motor coach service for passengers was indicated on the basis of its frequency. With respect to competitive truck service, the division officers in their reports to the general officer in charge of the investigation were required to describe the regular-schedule common carrier and irregular-schedule contract carrier truck services operating adjacent to each operating district in the division, and also to describe the service performed by trucks owned by individual farmers, or groups of farmers, which were handling freight once carried by the railway. An estimate was also made of the total number of tons of freight carried daily on the average by each of these three competitive transportation agencies.

On the basis of these divisional reports, a general analysis for each general district of the railway was made, showing railway and highway passenger and freight movement; and on the basis of these analyses, suggestions for the substitution of motor service were made. One analysis was made with respect to freight traffic, and the other with respect to passenger traffic. In the analysis of the freight service on the various general districts, a report was drawn up which had three headings: railway movement, truck movement, and suggested truck substitution for steam service. Under the first heading, the terminal points of each operating district were indicated, the nature of the service over it, the number of freight train crews involved, and the number of tons of l.c.l. freight handled during the year, divided to show the number of tons unloaded and the number of tons set out. The showing of tonnage set out covered only setouts made by way freight trains at intermediate stations. Under the truck movement heading, this statement showed the number of common carrier truck operators, the number of tons of freight which they handled and which the railway had formerly carried, the number of tons of freight carried by contract truck operators, and the number of tons of freight carried in the trucks of farmers.

On one branch line, for example, this analysis showed that freight service was operated daily except Sunday, one train crew being required. The number of tons of l.c.l. freight unloaded on this branch line during the year was 600 and the number of tons of l.c.l. freight set out

was also 600. Three competitive common carrier truck lines were in operation parallel to this branch line, and they handled during the year 9,000 tons of freight which had formerly been carried by the railway. Contract truck operators, operating parallel to this branch line, carried 1,500 tons of freight during the year, and trucks owned by farmers carried 3,000 tons of freight. On another operating district, the analysis showed that there was tri-weekly service during 10 months of the year, and daily except Sunday service during the other two months from one to two train crews being required. The tonnage of l.c.l. freight unloaded was 1,200 and the tonnage set out 2,000. Three common carrier truck lines were partially competitive with the railway in this district, and these carried 4,200 tons of freight during the year. Contract truck operators carried 4,400 tons of freight, and farmer trucks, 300 tons.

On one branch line over which a mixed train was operated daily except Sunday, the suggestion was made that a combination motor coach and truck be operated in substitution on a similar schedule. One train crew was employed on this branch line, 600 tons of l.c.l. freight were unloaded during the year and 600 tons set out. Three hundred tons were handled by competitive contract truck operators and 300 tons in farm trucks. The suggestion was made that a motor truck be operated parallel to another line, converting the existing daily-except-Sunday steam train service into tri-weekly service. On this line, 11,000 tons of l.c.l. freight were unloaded and 3,600 tons set out during the year. There was one partially competitive common carrier truck line which handled 1,000 tons of freight during the year, while 1,500 tons of freight were handled by contract carrier competitors and 1,000 tons by farm trucks.

A resume of the movement of l.c.l. freight over this general district and over competitive lines indicated that the number of tons of l.c.l. freight handled by the railway during the year included 110,600 tons unloaded and 65,400 tons set out. Common carrier truck lines during the same period carried 46,100 tons of freight, contract carriers, 55,950 tons, and trucks owned by farmers, 41,500 tons.

The analysis of the passenger service for each general district was made upon a somewhat different basis. This analysis showed the existing service between various points, the numbers of the passenger trains operated, and the train mileage operated annually. Earnings were shown on an annual basis, itemized as between passenger revenues, "headend" revenues and total revenues. Passenger revenues were based upon the average of actual revenues over a period of six months, while the "headend" revenues included actual revenues from mail, actual revenues from cream and estimated revenue from express. In addition to showing total revenues for the year, revenues in cents per mile were also indicated.

Following this, the analysis showed comparative operating costs as between steam train service, gas-electric rail car service and motor coach service, these cost figures covering annual expenses as well as the cost per mile. Then the analysis showed comparative net operating incomes, on the basis of revenues and expenses indicated, if steam service were continued, if gas-electric rail car service were established or if motor coach service were established. Finally this analysis contained a tentative substitution or abandonment plan, the kind of service suggested to replace the steam trains and an estimate of the annual saving to be effected by a substitution.

One passenger run covered in this analysis showed an annual passenger train mileage of 55,000, with total revenue of \$56,000, or \$1.02 per mile. This was divided between a passenger revenue of 80 cents a mile, or

\$44,000, and a "headend" revenue of 22 cents a mile or \$12,000. Operating costs for the steam train service at 73 cents per mile were \$40,000. It was estimated that the operating costs, if gas-electric rail car service were substituted, would be 32 cents a mile, or a total of \$18,000, while motor coach service might be substituted at a cost of 29 cents a mile, or \$14,000 for the year.

On the basis of these revenues and operating costs, the estimate of the comparative net operating income from the three kinds of service was as follows: Steam train, \$16,000; gas-electric rail car, \$38,000; motor coach, \$42,000. The recommendation was that a heavy-duty gas-electric rail car with a trailer be substituted for the existing steam train service, the volume of traffic being too heavy for a motor coach. It was estimated that the annual saving from the substitution of the rail car for the steam train would be \$22,000.

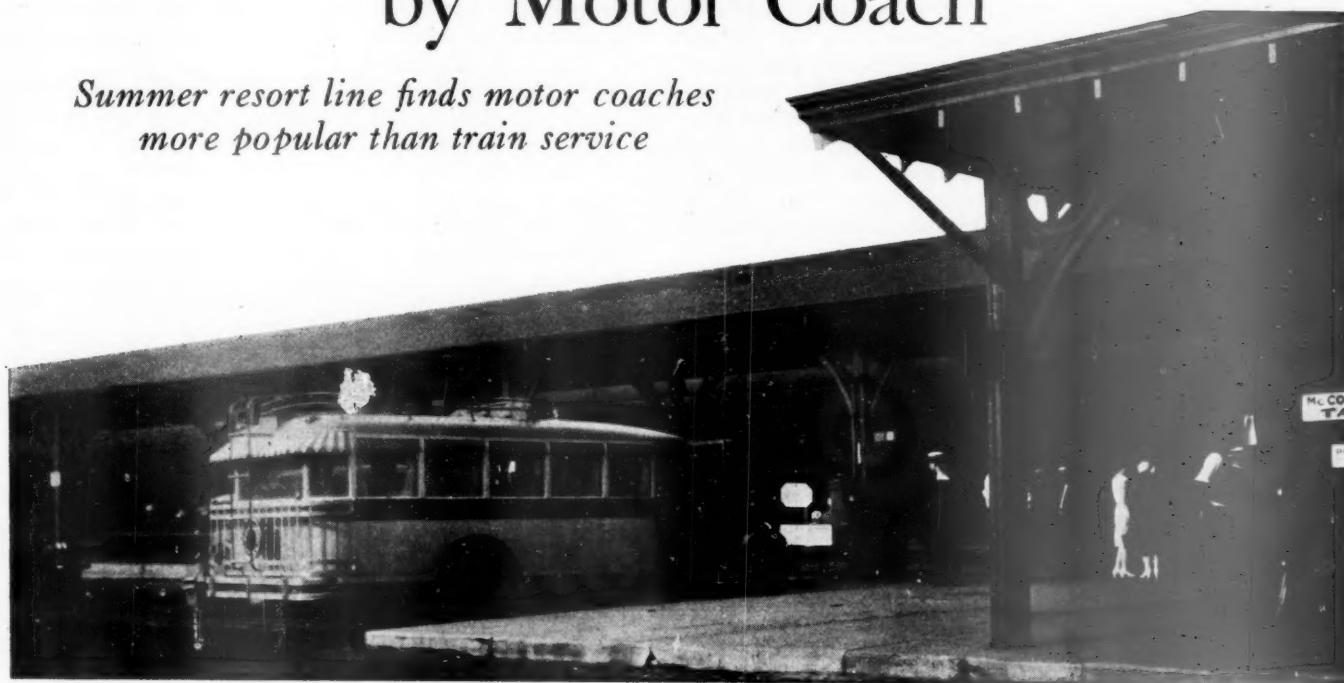
Between two other points two trains were operating an annual mileage of 31,000, the passenger revenue being 34 cents a mile, or \$10,000 a year, the "headend" revenue 21 cents a mile, or \$6,500 a year, and the total revenue 55 cents a mile, or \$16,500 annually. The cost of train service was \$22,500 compared with an estimated cost of \$14,000 if a rail car were operated and \$9,000 if a motor coach were operated. The deficit from the steam train operation was \$6,000 a year, while it was estimated that a net operating income of \$2,500 would result from the operation of a rail car, or \$4,500 from the operation of a motor coach. The suggestion was made that a motor coach be substituted for the steam train service, with an estimated saving of \$9,000 annually. In connection with this recommendation it was pointed out that the large number of railway employees using the train over a portion of its run did not justify its continuation with the resultant \$6,000 annual loss. It was pointed out that the railway line was paralleled by a hard surfaced highway upon which a competitive motor coach line operated three round trips daily. The suggestion was made that this line be purchased as a part of the plan to substitute motor coach service for the train service.

On another run, a gas-electric rail car was already being operated, making 70,000 miles annually and bringing in a revenue of \$33,000, or 47 cents per mile. The operating cost of the rail car was 21 cents a mile, or \$22,000 annually, while a conservative estimate of motor coach operating cost showed that this would be \$20,000. The net operating income from the rail motor car operation was \$11,000, while the estimated net operating income from a substitute motor coach operation was \$13,000. It was suggested that an annual saving of \$1,700 would be accomplished by the substitution of motor coach service for the rail motor car service. This recommendation was based largely on the fact that the rail car operation interfered with freight train service. The cost of this freight train interference, it was pointed out, would subtract to a greater or less extent from the \$11,000 net operating income shown under the rail motor car operation. Substitution of motor coach service should show a profit of \$13,000 a year, and would eliminate the interference with freight trains. In this case, as in the others, the annual saving mentioned was 85 per cent of the theoretical saving, since in this road's experience motor cars are available only 85 per cent of the time.

Although the preparation of these analyses requires much time and considerable expense, this railway, as a result of its studies, learned exactly what it could expect from the substitution of motor coaches or rail motor cars for the existing steam train service. The estimated annual savings to be made, \$132,000 in one case, \$87,000 in another, and \$25,000 in another, are impressive.

D. V. Handles All Passenger Traffic by Motor Coach

*Summer resort line finds motor coaches
more popular than train service*



Connection Is Made with the D. L. & W. at East Stroudsburg, Pa.

THE Delaware Valley serves, primarily, a summer resort section of the Pocono region. Prior to 1925, the rail service consisted of three round trips in winter and five round trips in summer, between East Stroudsburg, where a connection is made with both the main line of the D. L. & W. and the Belvidere division of the Pennsylvania, and Bushkill, the northern terminus. The train service was co-ordinated with the fast service of the D. L. & W. at East Stroudsburg and

The taxicab service made the trip from East Stroudsburg to a colony of summer camps near Bushkill in 55 minutes, while train service, including the switching time at East Stroudsburg and taxi or coach service from Bushkill to the camps, took one hour and 25 minutes. As the fare charged by the taxicabs was only fifty cents more than the combined train and coach fare, most of the traffic shifted to the highway.

The Delaware Valley Transportation Company was organized in 1924 to give transportation between the northern terminal, Bushkill, and the camps, which are located about four miles back in the surrounding mountains. In 1926, one of the vehicles used in the camp service was run over the highway to East Stroudsburg, replacing one of the trains taken off. This coach gave a direct connection between the camps, where most of the

Schedule of Rates

From East Stroudsburg to	From Port Jervis to	
	East Stroudsburg	\$2.00
Marshall's Creek	.25	1.75
Oak Grove	.30	1.70
Frutcheys	.35	1.65
Coolbaugh	.40	1.60
Echo Lake	.45	1.55
Turn Villa	.50	1.50
Shoemakers	.55	1.45
Bushkill	.60	1.40
Riverside	.75	1.20
Egypt Mills	.85	1.15
Nyce's Farm	.90	1.10
Briscoe's	1.00	1.00
Dingman's Ferry	1.20	.80
Connashaw	1.40	.60
Milford	1.60	
Port Jervis	2.00	

in summer, through cars were switched from the D. L. & W. trains to the Delaware Valley line. This gave a through-car service from New York to the summer resorts along the Delaware Valley.

A state highway runs parallel to the railroad for its entire length and this was the cause of a gradual reduction in rail traffic due to competition from private automobiles and large capacity taxicabs. In 1926, this competition had grown to such an extent that the full train service could no longer be continued at a profit, and the schedule was cut to two round trips in winter and three in summer.



The Coach Stops at Bushkill to Take Passengers to East Stroudsburg

traffic originated, and the D. L. & W. at East Stroudsburg, and proved to be very popular with the camp patrons. As the coach service also met the taxi competition by giving transportation at a lower rate of fare, it was decided in 1928, to replace all passenger trains with motor coaches, using the rail service only for freight traffic. While exact figures of the number of passengers carried are not available for comparison, the substitution of the motor coaches for the rail service has won back nearly all of the available traffic and has enabled the railroad to show a surplus over its running expenses. The summer resort traffic, beginning May 28 and lasting until after Labor Day, accounts for about 50 per cent of the total business handled.

With the inauguration of complete coach service, the line was extended from Bushkill north to Port Jervis, where a connection is made with the Erie. This service has been popular with salesmen, due to the fact that the nearest rail connection with this section must be made through New York involving travel over a distance of 160 miles. The Delaware Valley route between East Stroudsburg and Port Jervis is 42 miles long.

At the southern terminal, the coach service is co-ordinated with the arrival and departure of the express trains of the D. L. & W., as was the former train service of the

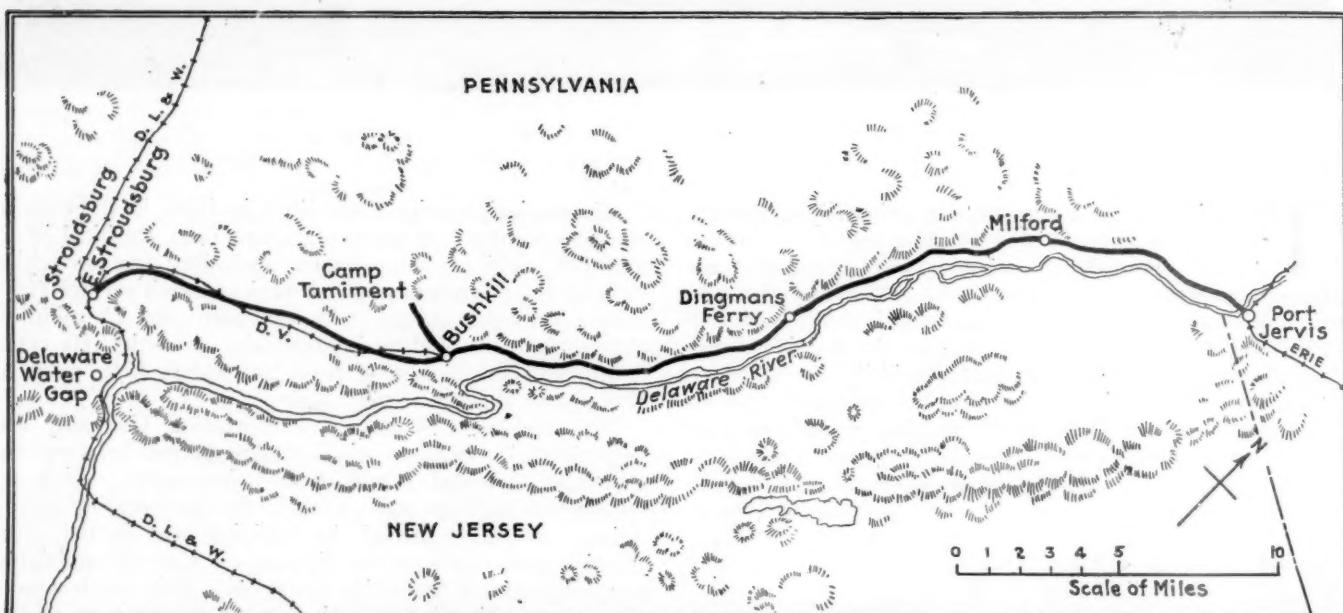
vania, three weekday and two Sunday trains are met with a maximum waiting interval of 37 minutes.

The present motor coach service is more frequent than was the train service even in its better days. The running time by coach between East Stroudsburg and the camps is 55 minutes. With the train service it was one hour and 25 minutes.

The schedule of the Delaware Valley Transportation Company is published in the time tables of the D. L. & W. and the Pennsylvania to the extent that it coordinates with the train service. Both railroads sell combination tickets over the Delaware Valley to Bushkill.

One way tickets are sold at rates shown in the table. A round trip ticket is sold, when requested, at double the rate of a single trip. Fifty-trip family tickets and a monthly school ticket, good only for the child whose name it bears, are also sold. The fifty-trip ticket between Bushkill and East Stroudsburg sells for \$18.16. At straight fare, 50 rides would cost \$30.00. The straight fare between East Stroudsburg and Bushkill is sixty cents and from Bushkill to the camps is forty cents. A high rate of fare is obtained between Bushkill and the camps because of the steep grades and rough roads encountered.

Baggage except trunks, is checked free of charge, and



The Delaware Valley Transportation Co. Runs Between East Stroudsburg, Pa., and Port Jervis, N. Y.

Delaware Valley. Northbound, six regular and two special trips are made daily. Train No. 3, on the D. L. & W. from New York, arrives at East Stroudsburg at 12:09 P. M., and the connecting coach leaves at 12:15 for Bushkill and Port Jervis. Also train No. 5 arrives at 4:43 P. M. from New York, and the coach is scheduled to leave at 5:00 for Bushkill and Port Jervis. On Sundays an excursion train arrives at 11:10 A. M. and is met by the motor coaches. Connections are also made with three daily and two special Pennsylvania trains from Trenton and Philadelphia.

Southbound, five regular and two special trips are made. A coach leaves Port Jervis at 10:00 A. M., arriving at East Stroudsburg at 12:55 to connect with D. L. & W. train No. 2, leaving at 1:10 for New York. Coach service from the camps for this train arrives at 12:55. Also, coach service to meet D. L. & W. train No. 6, leaving at 5:08 P. M. for New York, arrives from Port Jervis and Bushkill at 4:55. On the Pennsyl-

is very heavy due to the holiday nature of the traffic. At times it is necessary to run a truck to carry all of the baggage offered. A charge is made for carrying trunks unless they are checked in connection with a railroad ticket, in which case they are handled by the transportation company in the same way as railroad baggage, free of charge. There is also an additional charge for hauling trunks beyond the railroad terminus in Bushkill.

The equipment operated consists of one 14-passenger and three 21-passenger motor coaches and one 7-passenger touring car. The coaches are of the latest parlor-observation type, with inside and outside baggage racks. They are attractively finished in dust-proof grey, trimmed in red.

The operators are paid on a straight hourly basis and are allowed to make as many hours as they desire when business is heavy. They are also required to wear a regulation uniform.

Self Maintenance

compared with

Service Station Maintenance*

By H. V. Middleworth

Superintendent of Operations, Transportation Dept., Consolidated Gas Company, New York

THE conditions under which motor vehicles operate are so varied that it would be difficult to arrive at any fixed or definite rule governing the method of maintaining motor vehicle fleets. Furthermore it would be difficult to determine what the minimum number of vehicles should be, to justify the establishment of a self-maintenance organization. We speak of large operators and small operators, but just where to draw the line between the two is without doubt a difficult problem. Suppose we call a large operator one who operates 40 vehicles or more and a small operator one who operates less than 40 vehicles. It is obvious that the large operator, with equipment separated into small fleets in remote localities, would have a problem in the same class as a small operator, in which case it would seem reasonable to assume that service station maintenance would be more economical, considering miles traveled, time out of service, etc.

The successful and economical operation of a fleet of motor vehicles depends very largely upon the extent of its actual use in the capacity for which it is intended. Let a motor vehicle cease to function, for any cause whatever, and at once it becomes an item of expense. Therefore any legitimate means which may be employed to eliminate time out of service is a further step towards successful and economical operation.

Operating Conditions Must Be Studied

Before any definite conclusion is reached regarding the advisability of service station maintenance, a careful study should be made of the conditions under which the fleet operates. If it is found that the fleet is broken up into smaller fleets of approximately 40 vehicles or less, operating in several separate and remote districts, necessitating many miles of travel to and from a central repair station, then self maintenance, from an economical point of view, would seem out of the question. If, after careful study, it is decided that service station maintenance is desirable, a thorough survey should be made of the service-station facilities available in the districts from which the vehicles operate. In this connection, it is generally understood that service station managers are usually eager to get repair work from responsible concerns and that they are also willing to allow a satisfactory discount on this class of work. It is understood that business of this nature is frequently given precedence over that of smaller customers who are considered of less importance. Arrangements can be made with service stations to have work done at night, thereby eliminating the necessity of laying up the vehicles for repairs during the daytime. Painting can also be done over week-ends in order that the time out of service may be reduced to a minimum.

Service station maintenance is usually found to be satisfactory. Service stations are well equipped with modern machinery and appliances necessary to turn out a first class job. They are generally supervised by high class technical men, who are in charge of competent mechanics, specially trained in the repair and maintenance of their respective types of motor vehicle equipment.

But to operate and maintain a service station, such as described, entails a large outlay in property, building, machinery, tools, and equipment. It is also necessary to carry a sufficient stock of spare units, repair parts, accessories, materials and supplies, etc. The cost of such an establishment, together with interest on the investment, taxes, insurance, repairs to building, light, heat, power, water, etc., represents an expense which must be accounted for. Does it not seem reasonable to presume that the charges for service station work must be sufficient to cover the entire cost of maintaining the entire establishment, and is not the customer paying indirectly for this cost?

On the other hand, is not the large operator who maintains a central repair station, similarly equipped and operated, bearing the same burden of expense? In viewing this question from a number of angles, it might be well to consider some of the outstanding advantages and disadvantages of self maintenance.

Advantages of Self Maintenance

In the first place, in a self maintenance shop the work is constantly under the direct supervision of the person responsible for the maintenance of the fleet. Secondly, it is not necessary to carry more than a limited supply of spare units, repair parts, accessories, materials and supplies, since they can be procured direct from the service station as occasion may require. Third, self maintenance repairs may not be quite so thorough and still keep the vehicle perfectly safe to operate, while service station repairs are generally more extensive. For instance, an operator making his own repairs might make use of slightly worn parts which would render his vehicle entirely safe and in fit condition to operate for considerably more mileage. The service station, in most instances, as a matter of policy, would replace a slightly worn part with a new part, even though the worn part might still be good for many more miles of use.

In considering some of the disadvantages of self maintenance, I desire to call attention to a situation which may occur from time to time when the self-maintained repair shop becomes overburdened. The shop may be working to the limit on jobs already in, when by reason of accident or mechanical failure, a surplus of work may suddenly come in unexpectedly. This condition might require that one or more jobs wait a

* From a paper presented at the Semi-Annual Meeting of the Society of Automotive Engineers at French Lick Springs, Ind., May 25-29, 1930.

day or even longer before work could be started on them, which would mean that the vehicles would be out of service just that much longer. If they were sent to the service station, arrangements might be made to have such work given precedence over other work considered less important, thereby lessening the time out of service.

In summing up the situation, it seems to me that the vital factor affecting the successful and economical operation of a repair station is the careful selection of the personnel. If an operator has a sufficient number of vehicles so centralized as to justify the establishment of a self-maintained repair shop, and if he employs a supervisory force equal to that of the manufacturer's service station, there can be little doubt that self maintenance is more desirable than service station maintenance. If on the other hand an operator has not a sufficient number of vehicles so centralized, or in other words if a greater portion of his fleet is operating from several separate and remote districts, which would necessitate many miles of travel to and from a central repair station, and would cause an unreasonable period of time out of service, it would seem reasonable to consider service station maintenance.

Keeping Oil Containers Clean

IT is often difficult in handling and storing cylinder oil in the garage to prevent the pumps, containers and surrounding walls and floor becoming saturated with a mixture of oil drippings and dirt. The usual sloppiness around the oil containers seems to be caused by the fact that they cannot be easily moved to allow of an occasional thorough cleaning. The standard 50 gal. pump container furnished by most oil companies is quite heavy when full of oil, and usually has no convenient grab handles for lifting.

The Boston & Maine Transportation Company has overcome this difficulty by building a steel buggy to accommodate two containers. The frame consists of a 3 in. steel angle, welded at the corners and having cross bracing, which is mounted on four double-wheel, ball bearing casters, riveted to the frame.

With this device the containers can be easily moved when desired and the floor underneath kept as clean as any other part of the garage.



The Containers Are Easily Moved and the Floor Kept Clean

The Motor Coach Engine— Yesterday, Today, Tomorrow

(Continued from page 399)

of the fuel causes pre-expansion and loss of power, which becomes particularly obnoxious when intensified by high atmospheric temperature. A means of atomizing the fuel very finely as it emerges from the carburetor, and delivering it to the cylinders through short, direct, unheated intake passages, or a means of injection into the cylinders through metering nozzles of the atomizing type, would open up the way to an increase in power through the equalization of the amount of fuel mixture received by each cylinder and would also allow increased volumetric efficiency because the engine would be operating on a more dense mixture.

Cold Carburetion

Developments are now under way in both directions, and it is only a question of time until cold carburetion will be available in a highly satisfactory form. The advantages of such a system are numerous. In addition to the increases in power due to the better volumetric efficiency and more equal distribution, it offers a great advantage in the matter of internal cooling, as noted above. A cold carburetion system would obviously render an engine less liable to detonation and could be expected to be practical at a slightly increased compression ratio as compared with the carburetion system using a pre-heated mixture and depending for its cooling on the water circulating system.

Increases Displacement

It is problematical what form any further increases in the displacement of our motor coach engines will take. Our really large coach engines are all of the six cylinder type. They are not only large and heavy, but are all running close to the practical limit of piston speed. Any increase in length of stroke would not only increase the inertia stresses in the pistons, but would also multiply the centrifugal forces in the crankshaft, neither of which conditions are desirable. An increase in the cylinder bore would increase the length of the engine, and engines are already so long that they subtract from the space which is needed for passengers. Manufacturers are already recessing the dash boards of motor coaches so the driver and the passengers in the forward seats ride with their feet alongside the rear cylinders. An increase in bore would also increase the length of the crankshaft, increasing the problems arising from torsional vibration and decreasing the practical operating speed of the engine.

The use of the "eight-in-line" construction would not seem particularly hopeful, since this would magnify the problems of length and torsional vibration. The "V"-type eight, with its short overall length, rigid crankshaft, and the possibility of increasing the bore and shortening the stroke, giving the desired displacement with the reduced piston speed, seems very attractive. Aside from the problem of balancing, which is inherent in a crankshaft having four throws, and the possibility of a slight increase in maintenance cost due to the use of eight instead of six cylinders, there seems little to be said against such an arrangement provided that the whole job is designed along lines consistent with the requirements of motor coach operating practice.

New Equipment

Increased Power and Speed in Federal 3-Ton Truck

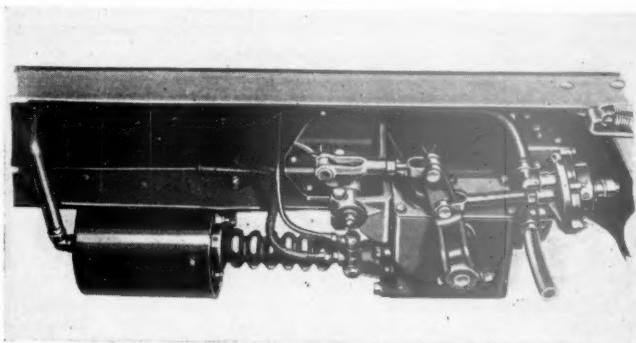
THE model U-6, 3-ton truck recently brought out by the Federal Motor Truck Company, Detroit, has a larger engine, and heavier power transmission units than the model which it supersedes. The engine is now a 6 cylinder, overhead valve type, developing 81 horsepower; the frame depth has been increased to 7½ in., the 4-speed transmission is heavier and has greater reductions, the springs are heavier and the axles have greater capacity, the brakes are larger and have a vacuum booster as standard equipment, the tires are larger, and the steering gear is heavier and has a greater reduction.

The bore and stroke of the engine are 4 in. and 4½ in. respectively, and the horsepower rating is developed at 2,200 r.p.m. The seven bearing crankshaft is 2¾ in. in diameter. The overhead valve mechanism, the fan and the generator are driven by an extra wide, silent timing chain which has an automatic adjustment. The exhaust manifold is so designed that the hot gases are discharged at the front of the engine, thus eliminating heating of the floorboards. A velocity-type governor is furnished which is set to allow a maximum engine speed of 2,200 r.p.m., giving a road speed of 33 m.p.h. in direct drive with standard axle ratio and 34 in. by 7 in. rear tires. In overdrive, the maximum speed is 42 m.p.h. The 12 in. dry plate clutch is fully enclosed in a special case on the rear of the engine. The seven speed, selective sliding, spur gear type transmission is mounted amidships with a three point support on the frame cross members. Stub tooth gearing is used, having a pitch of 5 to 7.

The front axle has roller thrust bearings at the spindles to assist easy steering. The rear axle is a heavy duty, worm drive type with a bevel gear differential and a one-piece pressed steel housing. Two gear ratios are furnished, standard 6½ to 1 and optional 7¾ to 1.

The four wheel, hydraulic, internal expanding service brakes have a vacuum booster connected with the brake pedal. The auxiliary brake is mounted on the worm shaft of the rear axle.

The semi-elliptic springs are 42 in. long by 2½ in. wide in front, and 54 in. long and 3 in. wide in the rear, with auxiliary springs 42 in. long by 3 in. wide operating on the rear only. Spoksteel, disc type wheels, de-mountable at the hub, are furnished. The irreversible



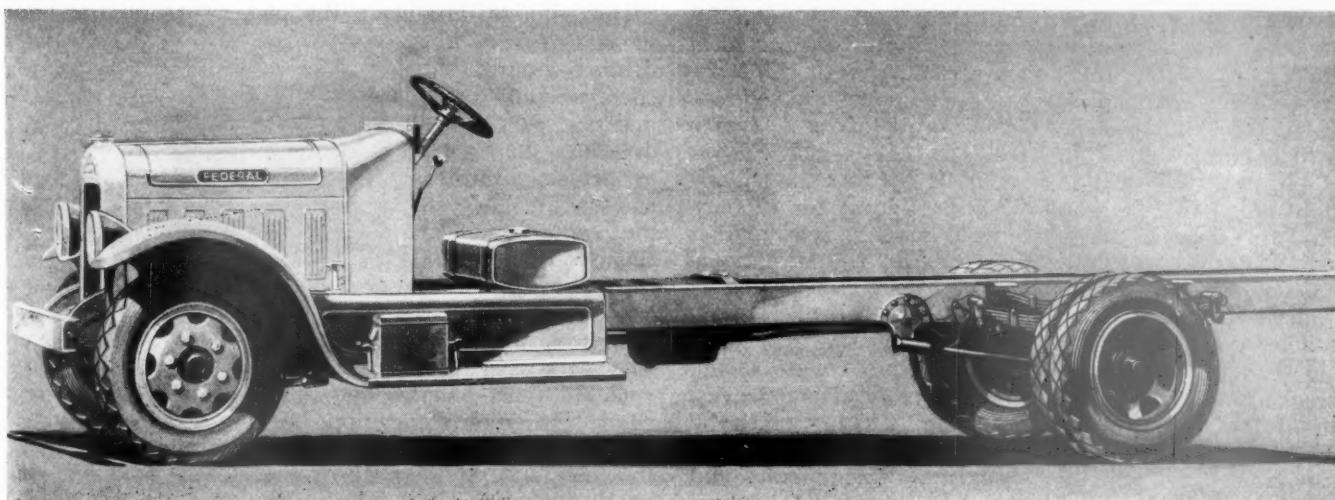
A Vacuum Booster Is Standard Equipment on the Model U-6

steering gear has heavy bearings and gives a 20 to 1 reduction in steering effort.

A gasoline tank, made of terne-plate, is mounted on the chassis frame under the seat and has a capacity of 32 gal. A vacuum fuel feed system with a separate strainer is mounted on the dash under the hood.

The channel section frame is 7½ in. deep and 3½ in. wide at the flange. It has six cross members which are hot riveted to the side rails.

The chassis weighs 6,900 lb. and the maximum allowable total gross weight is 18,000 lb.



Federal Model U-6, 3-Ton Truck

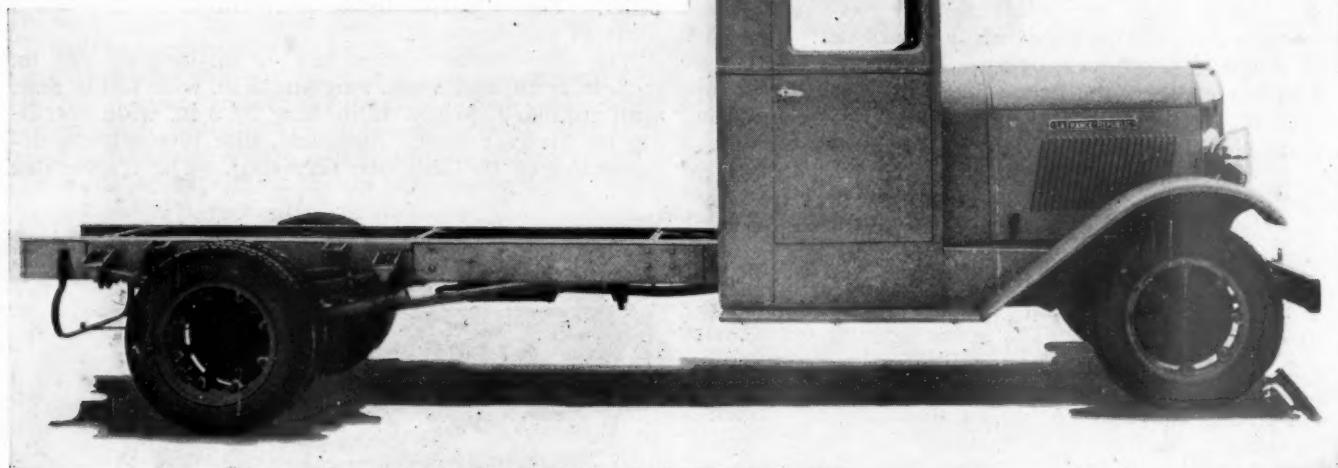
La France-Republic Builds a New Series of 2½-Ton Trucks

THE La France-Republic Corp., Alma, Michigan, has announced a new series of medium duty trucks of 12,000 to 13,000 lb. straight rating capacity. The new series, known as F-2, incorporates several improvements in construction and appearance

ing on all four wheels with the pedal pressure amplified by a vacuum booster. The emergency brake operates on the drive shaft at the center bearing support.

The pressed steel channel section frame is 8 in. deep with 3 in. flanges, and is made of $\frac{1}{4}$ in. stock.

La France-Republic F-2 Series Trucks Have
a Straight Rating Capacity of 13,000 lb.



such as: An 83 hp., six cylinder truck engine; an 8 in. frame with 3 in. flanges; floating rear springs; full swivel, ball type radius rods; oversize four-speed transmission; high, narrow radiator and newly designed front fenders.

The Lycoming, truck-type engine is of monoblock, L head construction and has a bore and stroke of $3\frac{3}{8}$ in. by 5 in., giving a piston displacement of 309.6 cu. in. The engine is said to develop 83 horsepower at 2,750 r.p.m.

A centrifugal water pump circulates cooling water through the tubular radiator. A 23 gal. gasoline tank is located under the seat, from which fuel is supplied to the engine by a vacuum tank. A governor is not installed as standard equipment on this model but is available at additional cost. Battery and coil ignition is used with manual advance.

The Fuller multiple-disc clutch and transmission are mounted in unit with the engine, which is supported at three points. The transmission is fitted with ball bearings throughout and has speed reductions as follows: First, 6.5 to 1; second, 3.7 to 1; third, 1.9 to 1; fourth 1 to 1, and reverse 7.8 to 1.

The two-piece tubular drive shaft has three metal, oil-tight universal joints and a ball bearing center support. A Timken bevel gear type, full floating, rear axle is used, having a standard ratio of $6\frac{1}{8}$ to 1. An optional ratio of 7.4 to 1 is available when greater tractive effort is desired.

The rear springs carry the load by means of a floating contact construction whereby the rear spring brackets are free to move on the main spring leaves, all of the driving and braking forces being taken by the radius rods. The advantages claimed for this design are that it eliminates shackles, spring bolts and bushings and does away with the necessity of lubrication at these points.

The service brakes are of the hydraulic type, operat-

The frame height, when loaded, is $30\frac{1}{2}$ in. from the ground.

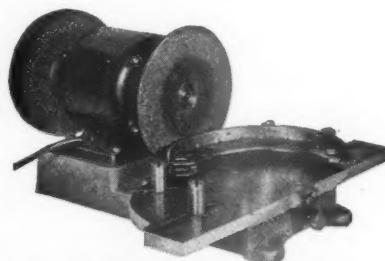
The standard tire equipment is 32 in. by 6 in. pneumatic, single front and dual rear. The F-2 series is built in three wheelbase lengths as follows: Model F-2, 174 in.; model FA-2, 198 in., and model FB-2, 146 in.

Rusco Brake Lining Grinder

THE Russell Manufacturing Company, Middletown, Conn., has announced a new and improved type of moulded brakeshoe liner grinder. The features of this grinder are that it quickly removes any high spots on the liners and it restores the surface of glazed linings, producing the proper arc on the liner to conform to the drum contour. The construction of the machine permits dressing the liners as perfectly on the ends as it does in the center, and it also cleans and burnishes the brakeshoe.

The machine is equipped with a heavy duty $\frac{1}{4}$ hp., enclosed type, ball bearing motor, with a double end shaft. The motor is equipped with a 10 in. steel plate, with an abrasive disc of a suitable grain for dressing the liner and, at the rear of the motor, an 8 in. wire brush for cleaning and burnishing the brakeshoe.

The adjustable grinding table is graduated for different shoe diameters, and adjustable stops are provided



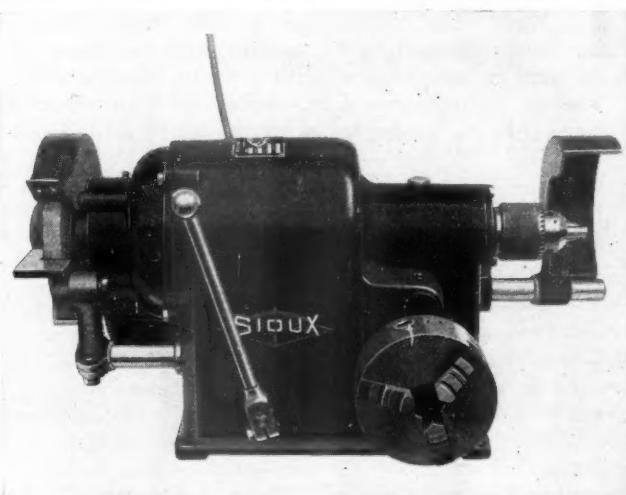
Brake Lining Grinder

coinciding to the diameter to which it is desired to have the lining finished. The depth of cut is controlled by means of a feed screw, placed at the front of the grinding table, and contact is maintained by two flat stops, three inches apart, placed directly in the center of the abrasive disc, thus insuring accurate dressing of the lining in the entire arc of its surface. The steel disc and the abrasive material are easily removed.

It is claimed that by grinding the moulded brakeshoe liners after applying them to the shoes and before mounting them on the wheel, 100 per cent contact of the liner is obtained at all points on the drum.

Sioux Utility Machine

ALBERTSON & CO., Sioux City, Ia., has developed a utility machine for use in repair shops having a small amount of machine work to do. The machine, known as No. 2000, is equipped with two chucks, one a 5 in. reamer drive chuck and the other having a capacity up to $\frac{5}{8}$ in. The 5 in. reamer drive chuck can be operated at slow speed, 29 r.p.m., intermediate speed, 46 r.p.m., and high speed, 69 r.p.m., by means of a conveniently placed and easily operated gear shift lever. The $\frac{5}{8}$ in. chuck is driven at motor speed which makes it useful for buffing, polishing and wire



Sioux Utility Machine, No. 2000

brush cleaning. A guard is provided for use with this chuck.

The transmission gears are heat treated and operate in oil to insure long life.

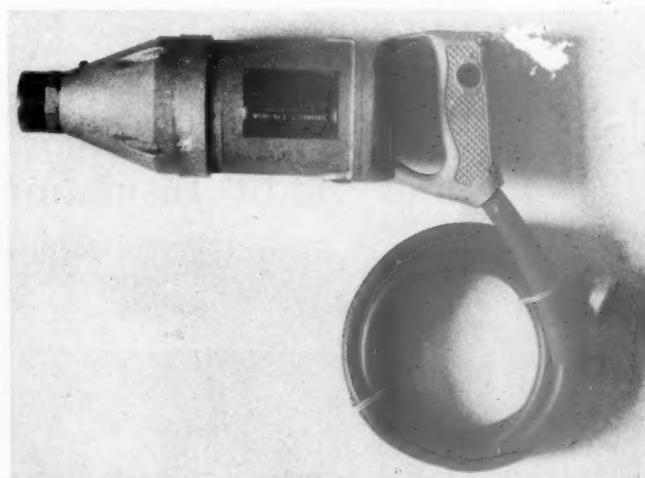
A 7 in. diameter by $\frac{3}{4}$ in. wide grinding wheel is furnished for tool and general purpose grinding, equipped with a guard and a tool rest which are adjustable to the size of the wheel.

The machine also has a braking device to bring the working heads to a quick stop, saving the time of the operator by allowing him to change the tools or release the work without waiting for the machine to come to rest of its own accord. After the current has been turned off by the combined switch and brake lever, further movement operates the braking mechanism, bringing the chucks and grinding wheel to a quick stop.

The $\frac{1}{2}$ h.p. motor and the main spindle operate on ball bearings. A cast iron pedestal, equipped with a water pot and a tool tray are furnished at additional cost.

Brill Multi-tool

THE J. G. Brill Company, Philadelphia, is now offering a portable electric hand tool known as the Brill Multi-tool which weighs $5\frac{1}{4}$ lb. and which has a four-bearing power unit. The tool was developed to obtain one power unit for a large number



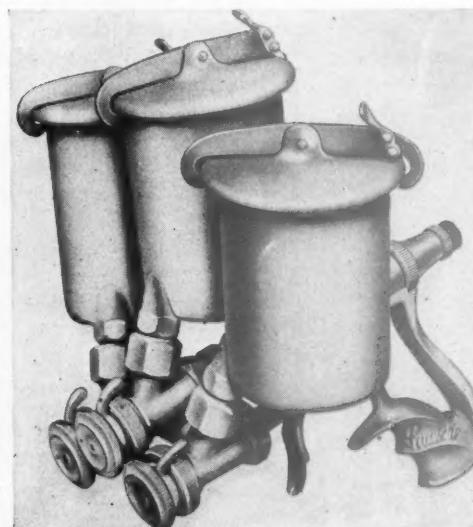
Brill Portable Electric Hand Tool

of different attachments. More than fifteen major operations and a number of minor functions may be accomplished by its use. These include drilling, grinding, buffing, sanding, sawing, nut setting, screw driving, planing, filing, valve grinding, reaming, under cutting, nibbling, shearing and mixing.

In addition to valve grinding and carbon removing, the multi-tool may also be used for body cleaning and polishing, tire and battery repairing and metal polishing.

Paasche Multicolor Airbrush

THE Paasche Airbrush Company, Chicago, has recently added a multiple unit airbrush to their line of spray painting equipment. The application of two, three or four colors at one time makes possible a great saving in time, and colorful decorative effects are easily obtained.



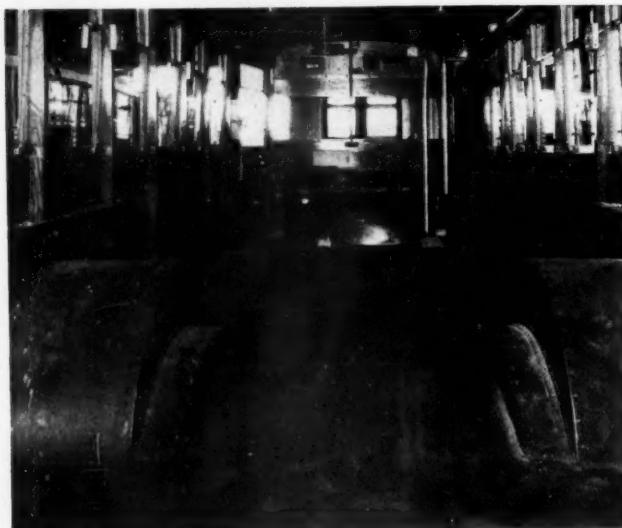
Paasche Airbrush for Applying 3 Colors

Each color is independently controlled so that all colors may be applied at the same time or shut off at will. The spray heads are of similar construction to the Paasche Universal Airbrush and can be controlled to produce a fine line or a wide spray.

The new multicolor airbrush can be used with a pressure feed tank whenever greater finishing speed is desired.

J-M Composition Flooring and Body Insulation

JOHN'S-MANVILLE Corp., New York, has produced a new type of composition flooring, known as Masticoke, for use in motor coaches. The ad-



J-M Masticoke Flooring

vantages claimed for this new material are that it is easily applied, durable, light in weight, water-proof, resilient, non-skid, and possesses insulating and sound-



J-M Salamander Body Insulation

deadening features. It is plastic in form and absorbs shocks and blows without cracking.

The material is manufactured in block form and is melted and applied hot to the wood or steel sub-floors to a thickness of $\frac{1}{2}$ in. While hot it is troweled to a preliminary finish and then rolled until cool.

The company has also developed a new application for insulating material in the construction of coach bodies. Two layers of Johns-Manville, 3-ply, Salamander insulation is placed between the roof and the headlining, as shown in the illustration, being supported by cloth tape which holds it in place until the headlining is applied. It is claimed that this method of roof insulation is effective in maintaining a more even temperature in the coach when it is exposed to the direct rays of the sun during the summer months. It also helps to maintain the interior at an even temperature in winter.

The insulation can also be applied to the side walls and floor. When used under the floor it is said to eliminate drafts and to help keep the passengers' feet warm in cold weather. It also deadens the engine and street noises that would otherwise enter the coach.

Sanding and Polishing Outfit

THE Van Norman Machine Tool Co., Springfield, Mass., has announced a new body-refinishing outfit, consisting of sanding and polishing tools to be used in conjunction with a $\frac{1}{4}$ in. electric drill.

The set includes one 4 in. sander with an arbor and 3 discs, one 6 in. sander with an arbor and 3 discs,

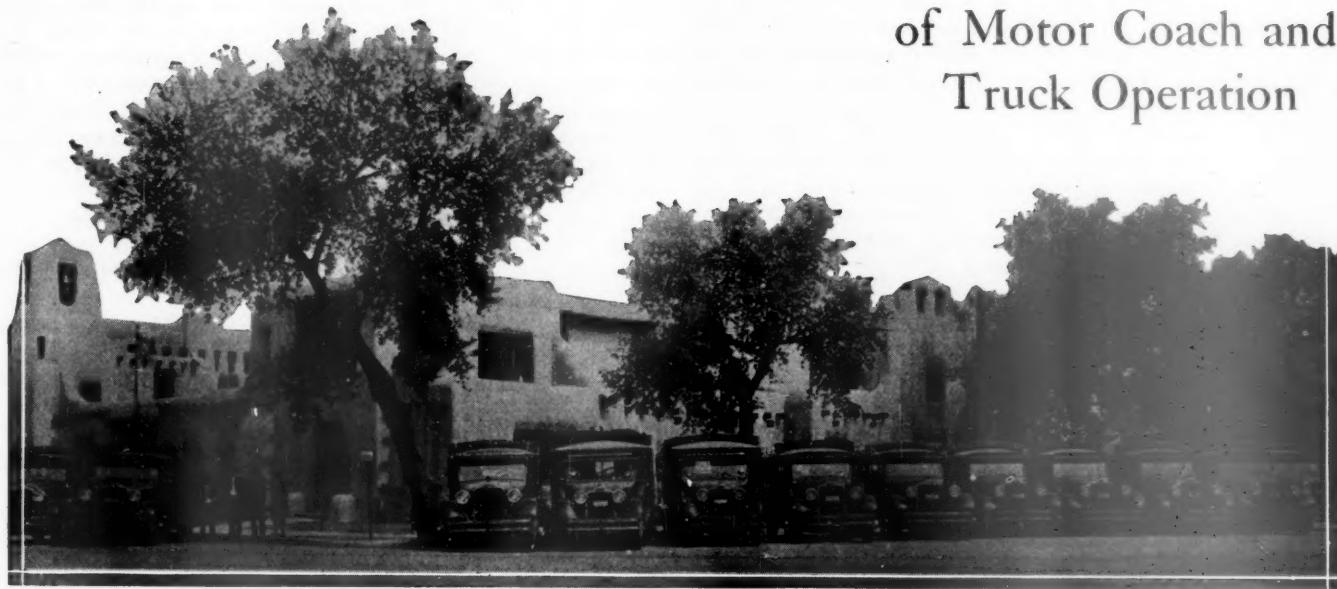


Van Norman Polishing and Sanding Outfit

one wool bonnet, one polishing pad with 2 flannel bonnets, one steel toothed, flexible, paint remover with arbor, one flexible drive abrasive wheel with arbor, one wire wheel brush, and one arbor for the sanders and polishers. A right angle drive is furnished for added convenience in using the various heads. All of the units are packed in a metal kit.

Every-Day Problems

of Motor Coach and
Truck Operation



This Month's New Questions

Question No. 30

Motor Coach Traffic and Fares

"What is the present per-mile basis of your motor coach fares? Is this lower or higher than a year ago? How does your rate compare with those of your competitors? Is the trend of fares toward higher or lower levels in your locality? How have reduced fares or special excursion fares affected the volume of traffic? Is enough additional traffic secured to increase the gross revenue? If so, has the increase in revenue been accompanied by an increase in expense? If motor coach fares were to be standardized, what in your opinion would be a reasonable rate?"

Question No. 31

Tires—Purchase or Contract?

"Do you buy your tires outright or do you have a contract with a manufacturer to supply tires in return for payment on a mileage basis? Why? If you own your tires, what is the extent of your tire repair organization? If you contract for tires, what have you done to eliminate the necessity of paying extra charges due to driver's running tires flat? How many miles do you average between roadside delays caused by tire trouble? Do your coaches carry more than one spare tire? What proportion of your total operating cost per mile is represented by tire cost? Is tire expense increasing or decreasing?"

What Is Your Answer?

Reply to Question No. 26

Road Failures and Their Prevention

"What have been the most frequently recurring causes of road failures? Have they been due to

faulty design or installation of equipment, or to mis-handling by the driver, or to careless maintenance? What action has been successful in reducing road failures? What is the average mileage between road failures? To what extent are drivers trained or equipped to make repairs on the road in case of a breakdown?"

Ignition and Fuel Systems Cause Failures

An analysis of road failures that have been experienced by this company during its operation indicates

that the majority of them are directly traceable to ignition and fuel system troubles. The ignition troubles have been to a large degree eliminated through the installation of dual systems, consisting of dual batteries, in which either battery may be thrown into circuit through a heavy duty double throw knife switch. Dual ignition systems have been installed consisting of two complete sets of coils, distributors, ignition switches, plugs, wiring, etc. A very thorough inspection is made of the complete electrical system every 5,000 miles, which is in addition to the regular service inspection each day. Fuel system troubles have been held in check by thorough inspections every 5,000 miles. Extra high grade gas line tubing has been used throughout, and all systems have been standardized as much as possible.

All road failures are completely checked as to cause, and the responsibility for the failure ascertained. If due to the negligence of the driver, he is penalized by the loss of his bonus, or he is placed in the shop for a short period. All garages are equipped with a large bulletin board placed in a conspicuous position. Failures are listed on the board, and if the responsibility falls on a mechanic his name is indicated on the board as the cause of the failure. In addition to this, there is a contest between the various garages, the winners of which are announced each month.

All drivers are furnished with a complete set of maintenance instructions in the form of a book. This book contains diagrams of the various systems, such as the electrical system, gasoline system, brakes, etc. All new drivers are placed in the school of maintenance which is under the direction of a mechanic instructor. Through lectures, study of diagrams and actual work on a motor coach, a driver becomes thoroughly familiar with its practical workings. A large test board is also used, and installed thereon are the various units, most of them in actual working order, such as the ignition system. All drivers are required to carry a standard set of tools, extra spark plugs, etc. Inspections of the tool kits are made at intervals and any lost or broken tools are replaced.

W. A. DUVALL,
Manager of Maintenance, Greyhound Lines.

Replies to Question No. 28

What Basis for Unit Overhauls?

"Which system of unit overhauls have been found to give the better results: Scheduling of unit overhauls on a fixed mileage basis, or overhaul only at times when inspection indicates that the unit may not give reliable service until the time of the next inspection period? Upon what experiences is the preference based? On what basis are decisions made whether to install a new unit or repair an old one? In scrapping a unit, what parts, if any, are salvaged, and in what ways are these parts later used?"

Overhaul When Inspection Shows Necessity

A schedule of unit overhauls on a fixed mileage basis brings about very good results, but from experience we have found that a specific mileage basis or a fixed mileage basis is not a determining factor. We have found by constant close inspection that units can run indefinitely, but when an inspection reveals a defect,

regardless of its being large or small, we remove the unit and thoroughly rebuild it.

We have found that removing units on a fixed mileage basis increases labor costs and often develops only that units are in first-class condition, taking into consideration normal wear. Our inspector is called by the mechanic making an inspection to examine units concerning which there might be some question. The inspector determines whether or not the unit should be removed. When it becomes necessary to scrap units, all serviceable parts are salvaged and used later for repairing and rebuilding units when necessary.

H. P. McDONALD,
Superintendent of Automotive Equipment,
Missouri Pacific Transportation Co.

Overhaul When Necessary

This company has followed the practice of making necessary running reports and over-hauling motors completely when necessary. Drivers turn in daily reports, showing the actual consumption of oil and gasoline, and when oil consumption becomes heavy, the block is removed and reground, and new pistons and rings are refitted.

Motor coaches operated by this company have made approximately 300,000 miles. Blocks have been rebored or new blocks used approximately every six months. It should be noted, however, that three motor coaches in the service of this company were experimental jobs and have required more service than the new equipment of the same type which has been improved.

D. N. PETERMAN,
Supervisor, Motor Transportation Company of the South

Depends on Inspections

Our units are overhauled only at times when inspection indicates that the unit may not continue to give reliable service. All of our unit repair work is done in our rebuild shop, which is charged with determining whether or not it is worthwhile to repair a unit and is further charged with salvaging such parts as are useless. The various units are examined by the various departments of the rebuild shop. All starters, generators, magnetos and other parts of the electrical system are examined by the electrician and repaired if this is deemed worth while. All power plants are examined by the engine rebuild section, and all axles and differentials by the axle department.

All of our major repairs are performed by the unit replacement method; i.e., when a motor vehicle requires major repairs to its engine, a rebuilt engine is sent to the line shop out of which the vehicle operates. The engines are exchanged and the removed engine sent to Texarkana rebuild shop for repair.

WARREN A. TAUSSIG,
General Superintendent, Southwestern Transportation Co.

Replies to Question No. 29

A Uniform Break-Down of Operating Costs

"What system is used in breaking down total operating costs in connection with motor coach and truck operations? What items are shown in such analyses, and what elements of cost are included in these items?"

What uniformity or lack of uniformity has been noted in the bases for arriving at operating costs used by railway motor coach operators? What considerations favor the adoption of a uniform system of cost analysis by motor coach and truck operators?"

Uses Maintenance Summary

The system used in breaking down the total operating costs in connection with the motor coach operations of the Northland Greyhound Lines consists of a maintenance summary by classes of motor coaches, which is drawn monthly. This summary includes the cost on the fleets with reference to five different sections of the coach, exclusive of costs due to accidents; the latter are kept separately and should not be charged to the maintenance budget, which is adhered to as closely as possible by the respective divisions. From this maintenance summary, a further break-down is made to the individual motor coaches, showing in addition miles per gallon of gasoline and oil as well as the percentage of time the coach operated during the month.

The whole plan is a budgetary one on a cost per mile basis and includes all labor and material, there being no capitalization whatever in maintenance. This, I believe, is probably the greatest evil now existing among motor coach operators, and probably contributes largely to the great variation in maintenance costs as reported by them.

R. W. BUDD,
President, Northland Greyhound Lines.

Uniform System Desirable

We recommend the accounting prescribed by the Missouri Public Service Commission which is based on the A. E. R. A. accounts of the Interstate Commerce Commission, which in turn are as far as practicable a duplication of the accounts prescribed by that body for the railroads.

While there are some minor exceptions, I have found that practically all railroad motor coach operators are using a similar system of accounts. A uniform system of accounting is very desirable for motor coach and truck operation, first, because it is necessary in order to have a proper analysis of the revenues and expenses; and second, because regulatory bodies will, as time goes on, demand reliable information for the fixing of rates.

P. J. NEFF,
Vice-president and general manager,
Missouri Pacific Transportation Co.

[The classification of accounts prescribed by the Missouri Public Service Commission for motor coach carriers having an annual operating revenue of \$100,000 or more is as follows.—EDITOR.]

Balance Sheet Accounts—Assets

I. Plant and Equipment

- 1001 Installed Prior to December 31, 1928
- 1002 Installed Since December 31, 1928
- 1003 Other Plant and Equipment Additions
 - (a) Cost of Plant and Equipment Purchased
 - (b) Plant and Equipment Under Construction

II. Investments

- 1005 Investments in Affiliated or Auxiliary Companies
- 1006 Other Investment Securities Owned
- 1007 Miscellaneous Physical Property
 - (a) Property Used in Other Public Services
 - (b) Other Investments Owned

III. Reacquired Securities Accounts

- 1008 Reacquired Capital Stock and Bonds
 - (a) Capital Stock
 - (b) Bonds

IV. Reserve Fund Accounts

- 1009 Corporate Reserve Funds
- 1010 Liability and Other Insurance Funds
- 1011 Depreciation Reserve Funds

V. Special Deposit Accounts

- 1012 Interest Special Deposits
- 1013 Dividend Special Deposits
- 1014 Other Special Deposits

VI. Current Assets

- 1015 Cash
- 1016 Loans and Notes Receivable
- 1017 Miscellaneous Accounts Receivable
 - (a) Net Balance Due from Agents, Drivers and Other Transportation Funds
 - (b) Other Accounts Receivable
- 1018 Interest, Dividends and Rents Receivable
- 1019 Materials and Supplies on Hand (Inventory)
- 1020 Subscriptions to Capital Stock
- 1021 Other Current Assets

VII. Prepaid Accounts

- 1023 Prepaid Insurance
- 1024 Prepaid Interest
- 1025 Prepaid Taxes and Licenses
- 1026 Other Prepaid Accounts

VIII. Deferred Charges (Unadjusted Debits)

- 1027 Discount on Capital Stock
- 1028 Unamortized Debt Discount and Expense
- 1029 Property Abandoned Chargeable to Operating Expenses
- 1030 Preliminary Survey and Investigation Charges
- 1031 Other Deferred Charges or Unadjusted Debits
- 1032 Treasury Securities

Balance Sheet Accounts—Liability

I. Corporate Capital Liability Accounts

- 1051 Capital Stock Issued and Outstanding
- 1052 Capital Stock Subscribed
- 1053 Stock Liability for Conversion of Securities
- 1054 Premium on Capital Stock
- 1055 Assessment on Capital Stock

II. Non-Corporate Proprietorship

- 1056 Sole Proprietorship
- 1057 Partnership

III. Funded Debt

- 1058 Long Term Debt
- 1059 Real Estate Mortgages
- 1060 Advances from Affiliated Companies
- 1061 Other Funded Debt

IV. Current Liability Accounts

- 1062 Receivers' Certificates
- 1063 Judgments
- 1064 Workmen's Compensation Awards
- 1065 Notes Payable
- 1066 Liability for Provident Funds
- 1067 Audited Accounts and Wages Payable
- 1068 Miscellaneous Accounts Payable
- 1069 Matured Funded Debt
- 1070 Matured Interest on Funded Debt
- 1071 Matured Interest on Unfunded Debt
- 1072 Dividends Payable
- 1073 Other Current Liabilities

V. Accrued Liabilities Not Yet Due

- 1074 Unmatured Interest
- 1075 Taxes Accrued
- 1076 Other Accrued Liabilities

VI. Deferred Credits

- 1077 Unamortized Premium on Funded Debt
- 1078 Other Deferred Credits

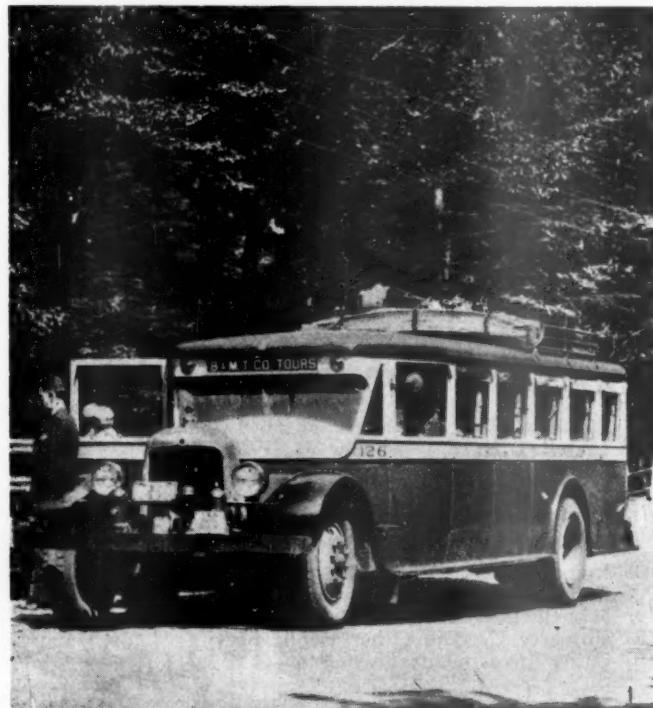
VII. Reserve Accounts

- 1079 Insurance Reserve
- 1080 Injuries and Damages Reserve
- 1081 Reserve for Depreciation
- 1082 Amortization of Capital Reserve
- 1083 Other Corporate Reserves

VIII. Corporate Surplus

- 1084 Additions to Property Through Surplus
- 1085 Surplus Reserved for Sinking or Other Funds
- 1086 Surplus or Deficit

Plant and Equipment	
I. General Property Accounts	
1101	Organization
1102	Franchises
1103	Patent Rights and Licenses
1104	Miscellaneous Capital
II. Physical Property Accounts	
1105	Lands Used in Operations
1106	General Office Buildings
1107	Shop and Garage Structures
1108	Stations, Shelters and Miscellaneous Structures
1109	Revenue Passenger Cars, Busses and Stages
1110	Revenue Freight, Express and Mail Trucks
1111	Service Cars and Equipment
1112	Shop and Garage Machinery and Tools
1113	Furniture and Office Equipment
1114	Miscellaneous Equipment and Other Tangible Capital
III. Undistributed Construction Accounts	
1117	Engineering and Superintendence
1118	Law Expenses
1119	Injuries and Damages
1120	Insurance
1121	Taxes
1122	Interest
1123	Other Expenditures
Operating Revenue Accounts	
I. Transportation Revenues	
1201	Passenger Revenue
1202	Baggage Revenue (busses and trucks)
1203	Special (chartered or for hire) bus revenue
1204	U. S. Mail Revenue (on busses)
1205	Express Revenue
1206	Freight Revenue (on freight trucks)
II. Miscellaneous Operation Revenues	
1210	Revenue from Station and Bus Privileges
1211	Parcel Room Receipts
1212	Storage Revenues from Freight and Baggage
1213	Rent from Buildings and other Property
1214	Other Operating Revenue
Operating Expense Accounts	
I. Maintenance of Plant and Equipment	
1301	Superintendence of Plant and Equipment
1302	Maintenance Department Rents
1303	Maintenance of Buildings, Fixtures and Grounds Owned
1304	Maintenance of Bus Bodies
1305	Maintenance of Bus Chassis
1306	Tires and Tubes
1307	Maintenance of Freight, Express and Mail Trucks
1308	Maintenance of Shop and Garage Equipment
1309	Maintenance and Operation of Service Car Equipment
1310	Miscellaneous Shop Expense
1311	Depreciation
II. Operating Garage Expenses	
1315	Fuel for Revenue Vehicles
1316	Lubricants for Revenue Vehicles
1317	Garage Employees
1318	Garage Supplies and Expenses
III. Transportation	
1320	Superintendence of Transportation
1321	Bus Drivers and Conductors
1322	Freight, Express and Mail Truck Drivers and Helpers
1323	Transportation Rents
1324	Station Expenses
1325	Freight and Express Collection and Delivery
1326	Loss and Damage on Freight and Baggage
1327	Road Expense
1328	Other Transportation Expenses
IV. Traffic Promotion	
1330	Superintendence and Solicitation
1331	Advertising
1332	Traffic Rents
V. Administrative and General Expenses	
A—Administrative Expenses	
1334	Salaries and Expenses of General Officers
1335	Salaries and Expense of General Office Clerks
1336	General Office Expenses
1337	General Law Expenses
1338	Administrative Supplies and Expenses
B—Other General Expenses	
1341	Employees' Welfare Expenses
1342	Valuation Expenses
1343	Regulatory Commission Expenses
1344	Amortization of Franchises, Patent Rights and Licenses
1345	Injuries and Damages
1346	Insurance
1347	Store Room Labor and Expenses
1348	Franchise Requirements
1349	Joint Operating Expenses Transferred
1350	Rent of Rolling Stock
1351	Other General Expenses
Income and Profit and Loss Accounts	
I. Operating Income	
1401	Operating Revenues
1402	Revenue from Affiliated or Auxiliary Operations
1403	Operating Expenses
1404	Expenses Due to Affiliated Operations
1405	Taxes
II. Non-Operating Income	
1407	Miscellaneous Rent Income
1408	Net Income from Miscellaneous Physical Property
1409	Dividend Income
1410	Income from Securities and Cash Owned
1411	Income from Sinking and Other Reserve Funds
1412	Release of Premiums on Funded Debt
1413	Other Miscellaneous Income
III. Income Deductions	
1414	Rent for Leased Property
1415	Net Loss on Miscellaneous Physical Property
1416	Interest on Funded Debt
1417	Interest on Unfunded Debt
1418	Amortization of Discount and Expenses on Funded Debt
1419	Miscellaneous Debits
IV. Profit and Loss	
1420	Balance at Beginning of Fiscal Period
1421	Balance Transferred from Income Account
1422	Miscellaneous Credits
1423	Appropriations of Surplus to Reserves
1424	Dividends Appropriations
1425	Appropriations for Investment in Physical Property
1426	Miscellaneous Appropriations of Surplus
1427	Other Deductions from Surplus



On a White Mountain Summer Tour of the Boston & Maine Transportation Company

Motor Transport News

Public Roads Bureau Test of Motor Coach Impacts

The Bureau of Public Roads, United States Department of Agriculture, in co-operation with the Society of Automotive Engineers and the Rubber Manufacturers Association, plans to inaugurate tests to determine the impact of motor coaches on modern highway surfaces. The investigation will be conducted at the Aberdeen proving ground, Aberdeen, Md., where a stretch of concrete paving for the purpose has been made available by the War Department. A motor coach manufacturer, interested in the tests, has loaned a large coach of the interurban type which will be operated at speeds up to 50 and 60 miles per hour. It is anticipated that tests will continue for about two months.

New York Trucking Plan of B. & O. Discontinued

Service abandoned after series of conferences following suspension on July 25

The Baltimore & Ohio has now abandoned its plan of co-ordinated rail-motor truck service for the handling of carload, unrestricted, non-perishable freight on Manhattan Island, New York City. The service, established on July 15, as announced in the *Motor Transport Section* of July 26, page 213, and temporarily suspended about 10 days later, as reported in the *Railway Age* of August 2, page 258, was permanently discontinued following conferences among executives of railways serving New York City.

At the last of these meetings the presidents' conference committee, consisting of the executives of the trunk line railroads, received a report of its sub-committee which had been studying the whole question of freight trucking in New York since August, 1929, when the Interstate Commerce Commission's decision in the so-called "constructive and off-track stations" case permitted the carriers serving New York to cancel their "constructive" station tariffs and to limit the practice of trucking in lieu of lighterage to interchanges of freight between railroads or between railroads and steamship lines.

(Continued on page 424)

Georgia Contract Truckers Held Subject to Regulation

State Supreme Court, in recent decision, upholds power of public service commission over these highway freight operators

The Georgia Supreme Court, in an unanimous opinion dated July 26, upheld the power of the Public Service Commission of that State to regulate contract truckers under the provisions of the Georgia Motor Carrier act of 1929. The case reached the Supreme Court on exceptions to an interlocutory injunction issued in Fulton County Superior Court which had stayed the attempt of the Public Service Commission to assume jurisdiction over the operations of the Saye & Davis Transfer Company.

This is the second recent court decision involving the Georgia Motor Carrier Act of 1929. In the Southern Motorways, Inc., case, an excerpt of which decision was published in the *Motor Transport Section* of April 26, page 1039, the District Court for the Northern district of Georgia upheld the constitutionality of the act.

The opinion of the court in the present case was written by Chief Justice Russell while two concurring opinions were filed, one by Justice Gilbert and the other by Justice Hines. Justice Gilbert's opinion was labeled "specially concurring."

The majority opinion opens with a

recitation of the title of the Motor Carrier act of 1929 in which it states the purposes of the act are fully indicated. Excerpts from the opinion, as published in a recent issue of the United States Daily, follow:

"The act is attacked as unconstitutional, (a) because it violates article 1, section 1, paragraph 3, of the State Constitution (Code, Sec. 6359), relating to due process of law; (b) because it violates the same provision of the Federal Constitution; (c) because it violates article 1, section 3, paragraph 1, of the State Constitution (Code, Sec. 6388), which prohibits property being taken or damaged for public uses without adequate compensation being first paid, in that it converts petitioner's business from that of private to that of common carrier; (d) because it violates article 1, section 3, paragraph 2, of the State Constitution (Code, Sec. 6389), forbidding any retroactive law or law impairing the obligation of contracts, in that it makes unlawful the operation of petitioner's business which was in existence before and at the time the act was passed. Rules and regulations of the commission

(Continued on page 424)

Improvements Made on 78,003 Miles of Highway During 1929

The highway departments of the 48 States improved a total of 32,522 miles of State highways during 1929, according to reports made public by the Bureau of Public Roads, U. S. Department of Agriculture.

Last year there were also improved 45,481 miles of local and county roads, exclusive of State highways. The reports indicate that there were 314,136 miles of highway in the State systems at the close of 1929 and 2,710,097 miles in the county road systems.

During the year the States spent \$910,485,291 on their portion of the foregoing improvements, while the counties spent \$807,714,604.

Coaches Now Serve Abandoned Railway Branch in California

The Pacific Greyhound Lines have established motor coach service between Petaluma, Cal., and Monte Rio, the territory formerly served by the narrow gage railway line of the Northwestern Pacific. Two schedules in each direction daily are operated between Petaluma and Monte Rio. At Petaluma motor coaches connect with the Pacific Greyhound Lines Redwood Highway motor coaches and also with trains of the Northwestern Pacific to and from San Francisco. The communities served by the new line have been without passenger transportation service since the Northwestern Pacific abandoned its railway line serving that territory some time ago.

N. J. Board Refuses Certificates for Jersey City-Camden Route

Public interest does not require new motor coach services proposed, it finds, in disposing of several recent petitions

The Board of Public Utility Commissioners of New Jersey in recent decisions denied the applications of several motor coach companies for the approval of municipal consents which had been obtained for the operation of motor coaches between Jersey City and Camden, N. J. Among the applicants was the Pennsylvania General Transit Company, highway subsidiary of the Pennsylvania; this railroad affiliate had two petitions rejected.

The decisions involving this Jersey City-Camden route (there were six in all) were dated July 28 and each was based on the joint decision rendered in connection with the petitions of three applicants. These latter were the Pennsylvania General Transit Company, the Nevin Bus Line, Inc., and the Public Service Co-ordinated Transport. The Pennsylvania General Transit Company sought the approval of municipal consents to operate 20 motor coaches between Jersey City and Trenton on an interstate route extending between New York City and Philadelphia, Pa., via Trenton; the Nevin Bus Line, Inc., petitioned for a rehearing upon its application for approval of municipal consents to operate 10 motor coaches between Jersey City, Trenton and Camden and certain intermediate municipalities; the Public Service Co-ordinated Transport applied for the approval of municipal consents to operate 15 motor coaches between Trenton and Camden.

Each of the foregoing applicants because of its past service to the territory claimed a "paramount right" over other petitioners. The Board did not pass upon this question of priority since it found that the proposed operation by the petitioners of additional motor coaches on the route would not be in the public interest. It did, however, refer to the question and suggested that the priority right might well belong to the Nevin Bus Line, Inc. That portion of the decision says: "A determination that some additional service is necessary would require a finding as to which of the petitioners has a paramount right to give the service. It is a recognized principle of regulation that where a utility already in the territory is willing to increase its facilities to supply the additional demand, it should have the prior right to do so. Other utilities should only be permitted to enter the territory when the existing utility either neglects or refuses to render the service. Under such circumstances it might very well be that the Nevin Bus Line, Inc., which is now rendering the identical class of service but in a limited manner due to the restrictions of this Board, might have a paramount right to

increase the service which it has supplied for several years past but which was denied by this Board because public necessity and convenience did not seem to require it."

The nature of the applications and the claims of the different applicants are set forth in the decision in part as follows:

"The application of the Pennsylvania General Transit Company proposes to operate twenty auto buses between New York and Philadelphia, along the main highways through the following municipalities: Kearny, Harrison, Newark, Elizabeth, Linden, Rahway, Colonia, Iselin, Menlo Park, Metuchen, Stelton, Highland Park, New Brunswick, Voorhees, Franklin Park, Kingston, Princeton, Lawrenceville and Trenton, thence across the Delaware River Bridge to Pennsylvania. It is proposed to do a local business between municipalities along the route. The operators propose to accept and discharge passengers at specified stations on the main line of the Pennsylvania Railroad and points along the main highway conveniently suitable to the public to provide what is termed in the testimony station-to-station service.

"The Nevin Bus Line, Inc., at present operates ten auto buses between New York, Camden and Philadelphia via Trenton with certain intrastate rights. Their route extends through the same municipalities as the proposed route of the Pennsylvania General Transit Company between Jersey City and Trenton with a slight variation in the City of Linden. From Trenton the route extends along what may be generally termed as River Road through Bordentown, Roebling, Burlington, Edgewater Park, Beverly, Delanco, Riverside, Riverton, Palmyra, Pensauken Township and Camden, thence over the Delaware River Bridge to Philadelphia. The present application is for rehearing of decisions dated June 12, 1927, and June 13, 1929. The operation of ten buses was approved, subject to restrictions set forth in the decision. It is now desired to modify the restrictions in order that the Company may carry on a town-to-town business throughout the entire route.

"The Public Service Coordinated Transport applies for approval of municipal consents to operate fifteen auto buses between Trenton and Camden. This application as amended anticipates the operation of buses in addition to the trolley service now rendered by the Company between Trenton and Camden. The proposed route is a portion of the same route applied for by Nevin Bus Line, Inc., and considered in this decision. The

(Continued on page 425)

First Co-ordinated Rail-Truck Service in Brazil

The first co-ordinated rail-motor truck service to be established in Brazil was recently inaugurated by the Estrada de Ferro Sorocabana, one of the most important railways in the Brazilian state of Sao Paulo, according to a recent report made public by the United States Department of Commerce.

The Estrada de Ferro Sorocabana is a State-owned railway, having a mileage of about 1,160, exclusive of double track and switches. In 1928 its receipts were \$9,734,197 and expenses \$6,578,788. It is a coffee railway, has the greatest mileage of any railway within the State, and from many points of view is the most important line in Sao Paulo.

Norfolk-New York Route Opened by Pennsylvania Co-ordinated motor coach and boat service inaugurated through subsidiary

Co-ordinated motor coach and steamship service between Norfolk, Va., and New York City was recently inaugurated by the Pennsylvania, through an affiliated highway operating company, the Pennsylvania-Virginia General Transit Company. One trip is made daily in each direction with schedules allowing approximately 16 hours for the entire journey from Norfolk and 13 hours for the motor coach portion between Cape Charles, Va., and New York.

Passengers leave Norfolk daily at 9:10 a. m. via the Pennsylvania boat, arriving at Cape Charles at 12:01 p. m. There the passengers board the motor coach for the trip to New York. The motor coach arrives at Philadelphia at 7:35 p. m. and a 37-minute rest period is allowed before the trip to New York is resumed. The motor coach arrives at the Pennsylvania Motor Coach Terminal in New York City at 1:57 a. m.

A motor coach will leave New York for Norfolk from the Pennsylvania Terminal each afternoon at 4:10 o'clock. The motor coach arrives in Philadelphia at 8:07 p. m. W. K. Jarvis, district passenger agent of the Pennsylvania in Norfolk, said that the schedule as now fixed is one of the fastest and finest in the country. Upon leaving Philadelphia the motor coach passes through Wilmington, Dover, Salisbury, Pocomoke, and Accomac, arriving at Cape Charles at 5:38 a. m. The passengers board the boat at 6 a. m. for Norfolk and arrive there at 8:30 a. m.

The fare one way to New York is \$8, while round-trip fares are \$14.50. The fare to Philadelphia will be \$6.05 one way and \$11.15 round trip. Only interstate passengers will be carried. The only exception to this rule will be in Delaware.

Interstate Transit Plans
New Sioux City Terminal

A \$125,000 motor coach terminal will be constructed at once at Sioux City, Iowa, by the Interstate Transit Lines, motor coach operating subsidiary of the Chicago & North Western and the Union Pacific. A large waiting room, ticket offices and rest rooms will be provided in the new station. A covered concourse, 22 ft. wide, will permit the loading and unloading of from eight to ten motor coaches at the same time. The station building will be two or three stories in height, faced with brick and trimmed in stone, and will provide space for seven retail stores in addition to the other terminal facilities.

N.A.M.B.O. Convention
at Chicago, Sept. 25-26
Program includes papers and discussions of motor coach operating problems

Plans are rapidly nearing completion for the 1930 annual convention of the National Association of Motor Bus Operators to be held at the Stevens hotel, Chicago, September 25 and 26, according to the announcement which followed a recent meeting of the annual convention committee at French Lick, Ind. The convention was previously scheduled for September 17 and 18 but the announcement states "because of a conflict in dates with other transportation meetings the later dates were afterwards agreed upon."

The first order of business, following the opening ceremonies will be the reports of officers and committees and the election of officers. The program also lists the following speakers and subjects:

Relation of Legislation to Business—Otis F. Glenn, U. S. Senator from Illinois.

Motor Coach Operation from the Private Car Owners' Viewpoint—Charles M. Hayes, president, Chicago Motor Club.

Selling Transportation to the Public—Henry A. Hohman, publicity director, Pickwick Corporation.

Co-ordination and Co-operation in the Handling of Inter-line Traffic—Report of President's Special Traffic Committee, L. D. Koller, general traffic manager, Greyhound Management Co., chairman.

Legislative Committee Report—S. A. Markel, chairman.

Effect of Federal Regulation on Operation—T. L. Tallentire, general counsel, Interstate Transit, Inc.

Motor Coach Taxation—R. W. Keenon, general counsel, Consolidated Coach Corporation, and chairman, Committee on Taxation and Vehicle Restrictions.

Modern Maintenance Procedure—H. P. Hewitt, assistant vice-president in charge of operation, Mitten Management Co.

California Coach and Truck Lines Report Declines in 1929 Business

Traffic and operating revenues decrease but increases in income from other sources bring larger net earnings

Decreases in both traffic and revenues from operations for the year 1929 as compared with 1928 were reported by motor coach and motor truck lines operating under the jurisdiction of the California Railroad Commission, according to the annual report of the commission's Stage and Truck Department. Motor coach lines in the State last year carried 29,619,020 passengers and collected gross passenger revenues of \$11,995,049; respective 1928 figures were 30,235,660 passengers and \$12,344,467 in revenue, thus indicating a decrease of 616,640 passengers and a drop of \$349,418 in gross revenues. Motor truck lines hauled 2,076,441 tons of freight in 1929 as against 2,130,106 tons in 1928, while their gross freight revenues fell \$17,126 or from a 1928 figure of \$9,249,698 to \$9,232,812 in 1929. It is pointed out in connection with the foregoing that many truck lines report only in terms of revenue and therefore the tonnage figures given do not fully show the total traffic handled.

From other sources these highway lines report a revenue of \$4,486,913 for 1929, as against \$4,020,367 for 1928, a gain of \$466,546, a total revenue from all sources of \$25,714,654 for 1929, as against \$25,614,532 for 1928, a gain of \$100,122.

The net revenue of the lines reporting in 1928 totaled \$1,530,584; in 1929 it reached a total of \$1,752,603, a gain of \$222,019. It is estimated by the Commission that 5,000 pieces of equipment are employed by motor carriers engaged in public highway transportation.

The annual report of the Stage and Truck Department is for the fiscal year ended June 30, 1930, but the statistics quoted above are for the year ending December 31, 1929. The report, however, further shows that there were on July 1 501 motor coach and truck lines operating under the Commission's jurisdiction, a decrease of 34 since July 1, 1929. The Commission's report accounts for the decrease by reference to the recently authorized consolidation of the major highway passenger lines.

Of the 501 lines, 71 (including 5 sightseeing lines) transport passengers only, and 166 transport property only. There are 179 lines carrying both passengers and property.

Of the property carriers 83 are "specialists"—that is, carriers whose authority to operate limits them to the transportation of special commodities, such as household goods, flour, eggs, milk and poultry supplies, farm produce, etc.

Annual reports of the carriers for the calendar year 1929 show that Class "A" carriers (those whose revenues exceed \$20,000 a year), have an investment of

\$30,893,963 in "plant and equipment, other property and material and supplies." The smaller carriers report an investment of the same character of \$2,314,773. The total investment of all the carriers, large and small, amounts to \$33,208,737.

Motor coach lines reported 257 accidents for the fiscal year resulting in 11 deaths and injury to 295 persons, only two of the killed being passengers; the others, with the exception of three pedestrians, being occupants of private cars.

As a result of the Commission's safety rule requiring motor coaches to stop at rail crossings not a single grade crossing accident involving motor coaches occurred in the period which is covered by the report.

The report cites a recent survey by the transportation division of the Commission which revealed that "not only are motor coaches playing an important part in local street transportation but they have practically replaced steam trains for short hauls." Los Angeles Motor Coach Company operates 146 motor coaches, Los Angeles Railway 119, and Pacific Electric Railway (all in Los Angeles and vicinity) 132 motor coaches. Key System Transit Company, Oakland and vicinity, operates 64 motor coaches.

The report deals at considerable length with the recent completion of the merger of the larger motor coach lines. This began as long ago as 1921, and culminated with a Commission order, dated May 30, 1930, transferring to Pacific Greyhound Lines, Inc., 14 large lines. The Commission also authorized that company to issue \$1,200,000 of notes to obtain funds to purchase new equipment.

Referring to service changes proposed in one of the many applications incidental to the merger, the Commission, in granting authority for the changes, declared that its order would "make possible a complete and comprehensive highway transportation service more fully in accord with the present needs of highway travelers and shippers than would be possible under separate disconnected and non uniform operating rights."

Further discussing this merger the report says "That truck lines may follow the same course appears to be indicated by events that have transpired in recent months."

The "events" are cited as an informal notice to the Commission that Pacific Freight Lines, Inc., a holding corporation, has through stock purchases acquired control of four large truck lines operating as common carriers, and is transferring to Pacific Freight Lines Company, the properties and operating rights of three other companies.

**Complaint Against U. P.
To Be Heard by I. C. C.
Railway motion for dismissal
of Pickwick-Greyhound
charges overruled**

The Interstate Commerce Commission has overruled the motion of the Union Pacific that it dismiss, in advance of a hearing, the complaint filed by the Pickwick-Greyhound Lines which charged the Union Pacific with having violated various sections of the interstate commerce act by acquiring and using the Interstate Transit Lines as a part of its system and in competition with itself and with other carriers in the territory served.

The report, made by Commissioner Farrell, says that for the purpose of disposing of the motion the commission must treat as established by competent proof the allegations of fact contained in the complaint, and that, if established, the alleged facts state matters over which the commission may properly exercise jurisdiction.

"It is true," he says, "that, improperly, the complainant has included in one complaint allegations indicating violations of the interstate commerce act and allegations apparently intended to indicate violations of other laws of the United States, but, upon the assumption above mentioned that the allegations contained in the paragraphs quoted are true, and notwithstanding that some doubt in the premises results from the language contained in paragraph 13 of the complaint, we think it cannot consistently be said, in the absence of a hearing, that the allegations in the complaint do not even tend to show that the Union Pacific has been guilty of violations of law in connection with matters over which we may properly exercise jurisdiction. Paragraph 13 of the complaint reads:

That the allegations of Paragraphs 6, 7, 8, 9, 10, 11 and 12 are grounded upon the fact that the Union Pacific Railroad Company purchased, owns, controls and operates the Interstate Transit Lines as a part of its railroad system, using the same to compete with itself and with complainant's lines, and other motor carriers and common carriers, both in the territory served by the Union Pacific and in the territory served by other common carriers, contrary to the provisions of the Interstate Commerce Act heretofore cited as well as in derogation of Sections 5 and 15a of said Act.

"The fact, if it be a fact, that the Union Pacific is using a common carrier which is not subject to the interstate commerce act, namely, the Interstate Transit Lines, in doing things prohibited by that act is not necessarily a matter of importance."

**Texas Commission Clarifies
Its Recent Motor Truck Order**

The Railroad Commission of Texas has issued a statement clarifying its recent order whereby it designated as Class A carriers those motor truck lines which haul cotton and other commodities on no fixed schedule, but who follow generally the same route in repeated trips (see

Motor Transport Section of June 21, page 1544.

In this latest notice the Commission, according to a recent item in the United States Daily, states that Class B operators who handle cotton or other commodities over a regular (fixed) route all of the way or part of the way are violating the law and are subject to prosecution. In order to avoid penalties, the Commission recommends that such carriers apply for a Class A temporary emergency certificate. Before this can be issued, the notice states, the applicant is compelled to meet the following requirements:

To pay the filing and license fees that the law prescribes for Class A certificates; to list the points between which and the route over which it is proposed to operate; to handle commodities for anyone offering them at any of the points on the route, and to apply the rates which have been prescribed or authorized by the Commission for application by Class A motor trucks.

"It will be unlawful," the notice reads, "for you to charge higher or lower than the rates which the Commission has prescribed or authorized, or to make any deduction from the rates or any rebates to shippers or consignees, or to make to any one any allowance not provided for in the tariff.

"It will be unlawful for you to use any of the trucks covered by your application for hauling from other places than those named in the application, and it will be unlawful for you to contract to haul cotton or other commodities from one or more firms or individuals with the trucks covered by your application except at the rates authorized by the Commission. You may, however, use any trucks on which a Class B tax has been paid and insurance provided in the conduct of an irregular service in handling other commodities, but not over a regular route or routes."

**Expansion Program Announced
for Southland Greyhound Lines**

Expansion of the motor coach routes operated by the Southland Greyhound Lines in Texas and improvements in the facilities of this company are planned in "a million dollar program" recently announced by Charles F. Wren, president of the Pickwick Greyhound Lines, with which the Southland is affiliated.

More than 400 miles of motor coach lines, the announcement says, were recently added to the 3,100 miles previously operated by the Southland; the addition gives the Pickwick System a new through transcontinental motor coach operation with western termini at Los Angeles and San Diego, Cal., and eastern termini at Corpus Christi, Tex., and New Orleans, La.

It is also planned in the latter part of the present month to open a new \$100,000 motor coach terminal at Laredo, Tex., while another involving a similar expenditure will be opened during October at Corpus Christi. The new station at Waco, Tex., estimated to cost \$150,000, is scheduled to open November 1.

**Hearings in Louisiana
on L. & A. Truck Plan**

**Co-ordinated freight service
proposals of road and sub-
sidiary scrutinized**

A hearing was held on August 19 by the Louisiana Public Service Commission in connection with the application of the Louisiana & Arkansas and its highway subsidiary, the Louisiana, Arkansas & Texas Transportation Company, for approval of the contract whereby a co-ordinated rail-motor truck service, including store-door pick up and delivery, would be afforded along the lines of the Louisiana & Arkansas. The railway and its subsidiary had previously been granted permission to commence the service, but this permission was recalled when the case was assigned for hearing.

Francis Williams, chairman of the Commission, according to a recent dispatch from Baton Rouge to the United States Daily, said in announcing the hearing:

"On July 3, 1930, the Louisiana & Arkansas Railway Company and the Louisiana, Arkansas & Texas Transportation Company presented to the Commission a contract under which the transportation company, an auxiliary or subsidiary of the rail carrier, would perform certain pick-up and delivery service at points on the railway company's line. Under the terms of the contract between the parties the actual transportation service between the termini would be performed by the railway company and the terminal, or pick-up and delivery service, performed by the transportation company. The contract was tentatively approved by the Commission.

"Further study of the contract *** indicates that it may be necessary for the auxiliary transportation company to qualify as a common carrier and file its tariffs with this Commission before the service in which it proposes to engage may be lawfully rendered. For this reason the railway company and its auxiliary, the transportation company, have been advised that the action of the Commission in approving the proposed contract has been this day rescinded and voided."

**Pickwick Plans Transcontinental
Service with its Duplex Coaches**

The Pickwick Greyhound Lines, according to a recent announcement, expects to have its new 53-passenger Duplex motor coaches in service from Los Angeles to New York and Boston by the end of the year. Three of these double-deck coaches were recently installed on the route between Los Angeles and Denver. They were assigned to that portion of the route between Salt Lake City and Denver, while it is planned in the near future to assign three additional Duplexes to the run between Los Angeles and Salt Lake City. The announcement further states that eight Duplexes have been sent East within the past month and are now operating over Pickwick Greyhound Lines out of Kansas City, Chicago and Cleveland.

Pacific Greyhound Lines Granted Nevada Permit

S. P. affiliate gets certificate for local passenger and express service

The Nevada Public Service Commission has granted to the Pacific Greyhound Lines authority to operate motor coaches in local passenger and package express service in Nevada. On two previous occasions the Nevada Commission denied similar applications. One was the application of the Rocky Mountain Stages filed in 1927, and the other was the application of the Pickwick Stage Line filed in 1928. These applications were denied by the commission on the grounds that public necessity did not require such service. In granting the application of the Pacific Greyhound Lines, the commission noted changed conditions in Nevada and the improved motor coach service of the west and found that there is public necessity for motor coach service at the present time. The authority for intrastate operation contains the stipulation that the certificate shall be temporary, to extend for one year, at the end of which time all interested carriers will again appear before the commission to show cause why the permit should or should not be made permanent.

Motor coach service will be maintained by the Pacific Greyhound Lines over the Sierra Nevada mountains through the winter. Local operations in Nevada were started on August 1, and additional schedules were established between San Francisco-Reno and Salt Lake City, giving two trips each way daily across Nevada. The new schedules give a transportation service in the western part of Nevada at a time of day when there is no other available service and also make possible a daylight trip between Reno and Elko.

Colorado Certificates Sought by San Luis Valley Southern

The San Luis Valley Southern has applied to the Colorado Public Utilities Commission for permission to operate motor coaches and trucks between Jaroso, Colo., and Taos, N. M., via Garcia and Costilla.

Work Started on New Motor Coach Terminal at Jamaica, N. Y.

Construction work was recently inaugurated on a new motor coach terminal in Jamaica, L. I., N. Y. The new terminal, the announcement states, will occupy a tract of three and one-half acres and will cost approximately \$1,500,000. It will be located adjacent to the Union Hall Street Station of the Long Island Railroad at Jamaica.

Building plans call for erection of a large arcade building with 28 shops; at one end will be a 46-ft. driveway leading to an open plot of nearly 40,000 square feet with loading and unloading platforms

large enough to handle approximately 21 motor coaches simultaneously. The platforms will lead to the waiting rooms and ticket offices to be located in the rear of the arcade building. Passageways to the adjacent Long Island station will also be included.

Rail Strike Involving Highway Company Averted in Ireland

Intervention of the Irish Free State government recently averted a strike on the Great Southern Railway of Ireland, involving the question of recognition by the Affiliated Irish Omnibus Company, a highway operator, of the National Union of Railwaymen as the trade organization of the latter's employees.

According to newspaper reports from Dublin, certain employees of the Great Southern, sympathetic with the demands of the Affiliated Irish Omnibus Company employees for recognition of the union, refused to handle traffic which had been interchanged between the highway line and the railway. These employees were discharged and when the union's demand for their re-instatement was refused, a strike on the railway was called. A postponement was agreed upon, however, pending a conference among the contesting parties and the Minister of Industry and Commerce. Following this conference the settlement was effected whereby the dismissed railway employees were reinstated and the Affiliated Irish Omnibus Company recognized the National Union of Railwaymen.

P. R. R. Coaches Established Safety Record During Past Year

Motor coaches of the Pennsylvania General Transit Company, Pennsylvania subsidiary, operating in the Sunbury and Williamsport division territory of that railroad, have established records of safety and dependability during their first year in service, according to a news item in a recent issue of the Pennsylvania News, published by the Pennsylvania.

The item reads in part as follows: "With lines operating between Sunbury and Lewistown, Sunbury and Mt. Carmel, Harrisburg and Wilkes-Barre, Sunbury and Bellefonte, the year's operation has been conducted without injury of any sort to a passenger and without accident to any of the coaches with the exception of occasional failure of parts, which resulted only in minor delay.

Regular runs and special party trips have produced an average of from 25,000 to 30,000 miles per month throughout the year, with strict adherence to schedules featuring the operation. An outstanding accomplishment of the year was the operation of the Sunbury-Lewistown run for three hundred consecutive trips, with exact schedule made at all terminals.

"Inaugurated on July 14, 1929, the service has gained an ever widening popularity."

Pelley Outlines Trucking Policy of the New Haven

President, in recent testimony, says road will expand service as permitted by I. C. C.

The policy of the New York, New Haven & Hartford in connection with the motor truck services now provided by its highway subsidiary, the New England Transportation Company, will be "to continue as we have and spread out as we may after the Interstate Commerce Commission has decided what trucks are to do," according to a recent statement by J. J. Pelley, president of the New Haven.

The foregoing statement was made by Mr. Pelley in the course of his testimony at the Interstate Commerce Commission's hearing in connection with the application of the New Haven to retain its permit to operate through its subsidiary, the New England Transportation Company, its present steamboat service in Long Island Sound.

Mr. Pelley explained that when he became president of the New Haven he found that the railroad, while operating a large number of motor coaches, was using no trucks at all. In view of the highly developed roads of New England, he said, he immediately set about opening up a trucking service, both in conjunction with trains and to replace trains on unprofitable runs.

Other New Haven witnesses who followed Mr. Pelley presented statistics to show the savings which had been effected by the installation of trucking services and also to indicate the extent of the competition of independent truckers for freight traffic in New Haven territory. F. J. Wall, assistant to the vice-president of the New England Steamship Company and the Hartford & New York Transportation Company, also controlled by the New Haven, stated that independent trucks have taken away approximately \$27,000,000 in annual revenue from the New Haven.

"As an interesting comparison," Mr. Wall continued, "the New Haven owns a total of 24,033 freight cars of all types with a total capacity of 832,543 tons. The 90 trucks operated by the New England Transportation Company are a small factor in motor transportation in southern New England when we consider that there was a total of 180,713 motor trucks registered in 1929 in the three states.

"The New Haven Road last year transported 30,000,000 tons of all kinds of traffic. The 4,500,000 tons estimated as being transported by the 255 trucking services, therefore, was equal to 15 per cent of the road's entire freight traffic.

Another of these New Haven witnesses, A. H. Fairfield, operating and commerce assistant, outlined savings which the New Haven has effected through its plan of co-ordinated rail, motor truck and steamship services. Mr. Fairfield presented an exhibit which indicated that 1,183,224 train miles a year has been eliminated because of motor truck substitutions.

New York Trucking Plan of B. & O. Discontinued

(Continued from page 419)

The foregoing decision of the commission in addition to permitting the continuance of the trucking in lieu of lighterage on interchange freight also permitted the Pennsylvania, the Erie and the Lehigh Valley to continue the trucking of freight between their railheads in New Jersey and their inland stations on Manhattan Island. The other roads had no established inland stations and thus when the commission's order was entered all their traffic which had been moving through "constructive" stations returned to their Manhattan pier stations.

It is understood that, in connection with the discontinuance of the B. & O.'s trucking plan, the Pennsylvania and the Lehigh Valley have agreed to readjust their present arrangements for the handling of freight by truck between their railheads in New Jersey and their inland stations on Manhattan. The proposed readjustment will be designed to effect a situation wherein truckmen, handling the freight between the railheads and the inland stations, will not be interested in completing the haul on this freight from the inland station to the door of the consignee—they will be agents for the railroads but will not at the same time compete, as they now do, for the cartage business of railway patrons with respect to the same freight which they have handled under their contract with the railways.

The Erie, it was stated, will continue its present trucking arrangements in connection with the operation of its inland station. This road, controlled by the Van Sweringens, employs for this service the United States Trucking Corporation, a subsidiary of the United States Distributing Corporation, which is in turn a subsidiary of the Pittston Company. The latter is a corporation organized by Van Sweringen interests last January (see *Motor Transport Section* of January 25, page 316).

Under the B. & O. plan, which is now permanently abandoned, shipments were transferred at its Staten Island terminals from cars to trucks and moved through the station of the B. & O. at Pier 21, Manhattan, to the doorway of the receivers without unloading. The same service was also available on outbound freight.

The option of receiving or shipping freight through this trucking service was given with the understanding that the shipper or consignee assumed the cost of loading and unloading the merchandise in addition to the trucking cost between the carrier's station at Pier 21, East River, Manhattan, and the shipper's or consignee's place of business. If immediate delivery was not desired the consignee was permitted to order that the goods be deposited at the pier station where he could call for them with his own trucks.

As pointed out in the July *Motor Transport Section* in connection with the announcement of the service, it was the

B. & O.'s attempt to meet the suggestions of the Interstate Commerce Commission regarding freight trucking in New York. That portion of the commission's "constructive" station case decision summarizing these suggestions was quoted in the above mentioned item in the previous issue.

Shortly before its suspension the B. & O.'s new service was attacked by four New York Terminal companies, Bush Terminal, New York Dock Railway, Brooklyn Eastern District Terminal and Jay Street Terminal. These brought suit against the B. & O. in the Federal Court at Baltimore charging that the new service was in violation of the Interstate Commerce Act. The complaint alleged, among other things, that the service constituted an extension of B. & O. lines and as such required the procurement of a certificate of public convenience and necessity.

Georgia Contract Trucks Subject to Regulation

(Continued from page 419)

adopted pursuant to said act, and to carry out same, are attacked as unconstitutional, 'in that they attempt to subject petitioner's business to public control and to convert its business as a private carrier into that of a public utility, without just compensation.' Other facts are stated in the opinion.

"It appears from the record that the Saye & Davis Transfer Company is a corporation created by the Superior Court of Morgan County for the purpose of

doing business as a common carrier. Before incorporation there was a partnership existing between the applicants for charter. Upon learning that the Public Service Commission of Georgia proposed to take jurisdiction of their business, Saye & Davis filed a petition in Fulton Superior Court for injunction.

"A temporary restraining order was issued and upon a hearing an interlocutory injunction was granted on Nov. 22, 1929. The exception is to that judgment. In the petition it is contended that, regardless of its corporate character, the petitioner is not a common carrier; that it does not engage in the business of a common carrier nor hold itself out as such, and for a considerable period of time has not transported any except for five customers who are Sears, Roebuck and Company, Rogers Stores, Inc., Gulf Refining Company, Wofford Oil Company, and McConnell & Sons Company, and has neither the intention nor the facilities for transporting goods for any additional customers.

"It is therefore insisted that this carrier is not under the jurisdiction of the Commission. In an answer filed by the Commission it is insisted that petitioner is a common carrier; but that if it were a private carrier only, it would be subject to regulation by the Commission under the act approved August 29, 1929, and known as the Motor Carrier act of 1929. The Commission further contends that petitioner is subject to regulation, because its business is affected with a public interest.

"Besides the immediate parties, some 25 short-line railways of the State have filed a brief as *amici curiae*. The defendant in error relies upon the case of *Frost & Co. v. Railroad Commission of California*, 271 U. S. 583. We think, however, that the controlling point is not one of differentiation but public interest. If this transfer company can make contracts as a private carrier with five customers, it can just as lawfully do so with 500 others, and in each of the additional instances it would be as much a private carrier as before. The result would be that the State, which owns the highways, would be compelled to keep up the track used by this private carrier, maintain and repair it, and be helpless when the carrier would tauntingly say, 'I used your road in my business and let the citizens of the State keep up my means of transportation.'

"Numerous courts have decided that where the use of the highways is by one who conducts a business which affects the public interest, such business is subject to regulation by the State. The State has a proprietary right in and to its highways, and therefore has the power to prohibit or regulate and control the use of its highways for purposes of private gain. In *Hazleton v. Atlanta*, 144 Ga. 775, as in other cases, this court has decided that the streets and highways of the State belong to the public, and that it is within the power of the State to prohibit or condition the use of them by carriers for hire, that this power is vested in the legislature and may be given or withheld, and no constitutional right, State or Federal, to

Joint Tariff Committee Is Formed by Southern Lines

Representatives of motor coach lines operating in the South met in a tariff conference at Atlanta, Ga., on August 6, and appointed a Permanent Joint Southern Tariff committee with headquarters at Atlanta. The purpose of the meeting was to consider the framing of a joint tariff and to carry out the work of constructing such a tariff; representatives of 27 motor coach lines attended.

It is anticipated that the proposed tariff, to be known as the "Southern Joint Tariff," will prove valuable not only to participating carriers but to all motor coach operators throughout the country for use in quoting long-haul fares.

Following are members of the Permanent Joint Southern Tariff committee appointed at the meeting: B. A. Wahle, Southern Greyhound Lines (Chairman); P. G. Howe, Alabama Bus Company; A. D. Butler, Consolidated Coach Corporation; J. H. Quattlebaum, Queen City Coach Company; T. W. DeZonia, Teche Transfer Company.

use the highway for private gain is invaded.

"This power is upheld in the case of Frost & Co. Commission, *supra*, relied on by the transfer company. The business of a carrier for hire is necessarily affected with a public interest. Even if the carrier has not dedicated its property to the public use as a common carrier, the very nature of the business is such that it is affected with a public use. In *Retledge Co-op. Assn. v. Baughman*, 153 Md. 297 (138 Atl. 29), a cooperative association was chartered to market and transport milk and other farm produce and procure and deliver for its members such materials and supplies as might be needed, and its business of transportation was restricted to its members. * * * *

"If the defendant in error in this case can say that it is relieved of regulation because it transports only for five customers, with how much more force might this cooperative association insist upon the same when it only transported materials for its members. Yet the Court of Appeals of Maryland held that this association was subject to regulation under an act that was not an unconstitutional exercise of legislative power. The court also held that the State has power to prevent appropriation of highways dedicated to use of public, by persons using them for transportation for hire to such an extent as to render them unsafe for public use. * * * *

"The motor-carrier act now under consideration is very similar to the Maryland Statute, and so it can be well said, as was said in the case above, that the jurisdiction of the Public Service Commission must be determined by the nature of the subject-matter rather than any other consideration. The gist of the decision in the Frost case, *supra*, as far as the case at bar is concerned, is that it was not within the power of the State to convert a private into a common carrier; but, as we have shown, in instances where the public interest is affected by a carrier's use of the public highways it is immaterial whether the carrier itself be public or private.

"In the Frost case the Supreme Court of the United States had under review the decision of the Supreme Court of California construing the Auto Stage and Truck Act of California, as amended in 1919, and held:

Assuming that the use of its highways by private carriers for hire is a privilege which the State may deny, it can not constitutionally affix to that privilege the unconstitutional condition precedent that the carrier shall assume against his will the burdens and duties of a common carrier.

"It was further held that the requirement that private carriers should become common carriers was a violation of the due process clause of the Fourteenth Amendment. Recognizing that we are bound by the decisions of the Supreme Court of the United States, it does not appear that the decision of the case at bar is affected by the ruling last stated, for the reason that there is no requirement in the Georgia-Motor-Carrier act that the carrier, in order to receive a certificate of convenience and necessity, shall become a common carrier.

Excursion Rate Reduction Announced by Greyhound

A reduction of approximately 10 per cent in one way and round trip excursion fares between Los Angeles, Cal., and San Diego, Long Beach and eastern points was effected by the Pacific Greyhound Lines on August 10. Reduced fares are reported to be the lowest in the history of transcontinental motor coach transportation. In announcing the new fares, H. A. Wooster, general traffic manager, said correspondingly low fares would be in effect from other southern California points to eastern destinations.

"We expect that these rates will stimulate travel through the southwestern states and afford everyone who wishes to visit eastern cities an opportunity to do so at a reasonable cost," said Mr. Wooster.

Some of the reduced fares now in effect are as follows: To Chicago, one way \$38.70, round trip \$73.55; to Denver, one way \$24.75, round trip \$47.05; to Fort Worth, Tex., one way \$31.50, round trip \$59.85; to Houston, one way \$35.00, round trip \$66.50; to Kansas City, one way \$31.50, round trip \$59.85; to New Orleans, one way \$39.50, round trip \$75.05; to St. Louis, one way \$35.10, round trip \$66.70.

"On the contrary we are dealing with the question as if the defendant in error were doing business as a private carrier, although it appears that it was incorporated as a common carrier, and we think the act provides for the regulation of this company even as a private carrier. However, even were we to treat it as a common carrier, we should not be within the inhibition of the Supreme Court of the United States against compelling this company to become a common carrier, because it has already asked the Superior Court of Morgan County to create it as a common carrier and so declare it to be under the law."

In *Barbour v. Walker*, 126 Okla. 227 (259 Pac. 552), dealing with an Oklahoma statute similar to the Georgia Act in that it provided for the regulation of the use of public highways for motor carriage for hire, and there being nothing in that act of requiring carriers to become common carriers as a condition precedent to obtaining a certificate of public convenience and necessity, the court held:

A private motor carrier operating over the public highways of the State, though without regular or fixed time schedules between fixed points in the transportation of commodities for hire under separate contracts with several principal business concerns located and doing business in one of such points, is a "motor carrier," within the meaning of chapter 113, S. L. 1923, and is subject to control and regulation by the provisions of law therein provided.

In his "specially concurring" opinion, Justice Gilbert said in part as follows:

"I am of the opinion that Saye & Davis Transfer Company is a common carrier. They were so incorporated, and they are transporting goods for hire on the public highways of the State. The fact that they are restricting themselves at any given time to a limited number of persons, with whom they make individual contracts does not make them private carriers. The character of transportation is the same as if they were common carriers. The charter itself announces to the world that the company is a common carrier, and the world is authorized to infer that their transportation facilities are being offered to every one as far as their facilities will permit. * * *

"The Motor Carrier act does not undertake to compel a private carrier to become a common carrier in order to use the public highway for the purposes of transportation. In this particular it differs from the California act, as construed by the Supreme Court of California, *Frost Trucking Co. v. Railroad Commission*, 70 Cal. 464. Except in the caption of the act, it contains no reference to liabilities of a common carrier, and reference in the caption is not sufficient to constitute binding legislation. The company, even if not a common carrier, is not strictly a private carrier, as are vehicles operated upon the public highways, not for hire, but for the convenience and benefit purely of the owners. * * *

"The effect of the growing business of operating motor vehicles for hire on the public highways must be apparent to every man of ordinary sense. Courts cannot be blind to those things which are apparent to every citizen. The construction and maintenance of the public highways is of vast importance to the happiness and prosperity of all. Upon our public highways are expended immense sums of money, time, and labor, all of which must be supplied by the general public. The congestion, to say nothing of pure accidents and negligence, is exacting a toll of human lives and destruction of property that is appalling. It constitutes an increasing menace. The size and weight of such motor vehicles constitutes an extra burden on the wear and tear of highways, and adds to the dangers. It is unthinkable that the sovereign State cannot lay its hand on the traffic for the purpose of regulation, control, or even prohibition where regulations are not obeyed."

Jersey City-Camden Certificates Refused

(Continued from page 420)

Pennsylvania General Transit Company has also applied for approval of consents to operate buses over this route, the disposition of which application will subsequently be considered.

"The Pennsylvania Railroad Company has for many years furnished frequent express and local train service to municipalities between Jersey City and Trenton, making connection at the latter point with trains passing through communities along the Delaware to Camden.

"Public Service Coordinated Transport and its predecessors, in the development of a trolley system in this state, constructed lines extending from Jersey City to Newark and between Newark, New Brunswick and Trenton. Another branch of this Company's system extends from Trenton to Camden. * * *

"In surveys made of the route between Jersey City, Trenton and Camden, in connection with previous applications made by the Nevin Bus Line, Inc., there appeared a necessity for additional service between certain points on the route which was not then provided by trains, trolleys or buses and the Board, accordingly, approved of the applications.

"In addition to the buses operating along these several routes within the State, there has been a yearly increase in the number of buses operating solely in interstate traffic from points along the routes under consideration to New York and Philadelphia. Consideration must be given to the number of people using interstate buses, affording of necessity an express and semi-express service. The operation of interstate buses serves in part the demand for the buses applied for in the instant applications from points in New Jersey to New York and Philadelphia.

"Considerable testimony was taken and numerous exhibits were offered by the various petitioners to demonstrate their respective rights to serve the public necessity and convenience along the proposed route and to obtain the Board's approval of the municipal consents for that purpose. By stipulation all of the testimony and exhibits were to be considered as the record in each of the individual applications. Each of the petitioners admitted that public necessity and convenience required the additional service along the proposed route, either in whole or in part, according to the extent of the petitioner's application. That admission, however, was in the interest only of the party making it. In other words, each petitioner admitted public necessity and convenience to himself but denied its existence for the benefit of the other petitioners.

"The Pennsylvania General Transit Company contends that it had a paramount right over all the other petitioners to serve the proposed route because its affiliated company, the Pennsylvania Railroad Company, had been rendering railroad service over this route for over fifty years past.

"The Public Service Coordinated Transport contended that it had a paramount right to serve the proposed route because one of its predecessor companies had served over the entire route a street transportation system for many years past and this class of service was comparable with the proposed service and hence had a claim greater than the Pennsylvania General Transit Company because the long time service of the Pennsylvania Railroad Company was not similar in character to the service now proposed.

"The Nevin Bus Line, Inc., claimed a paramount right to serve the route in question because it had first inaugurated a bus service along this route and was

actually serving under restrictions put in effect by the Board over the entire route in question and had for more than five years past applied to this Board to lift the restrictions so that it might render the service now applied for by all the petitioners.

"Regardless of the admissions of all the petitioners as to necessity and convenience, the proofs now before the Board clearly demonstrate that all of the communities along the proposed route are being adequately served by various kinds of transportation, namely, railroad, street railway, and auto bus transportation.

"The Board finds and determines that public necessity and convenience does not require additional auto bus transportation along the proposed route and therefore the claim to a prior right to give the service as between the parties hereto need not be passed on in this application.

"Upon consideration of the evidence and exhibits the Board finds and determines that the proposed operation of additional auto buses by the petitioners herein is not necessary or proper to serve the public and therefore denies the applications."

Another Pennsylvania General Transit Company application was involved in the other five decisions in connection with the same route which, as noted at the outset, were based upon the order discussed in the foregoing. In another petition this company had sought the approval of municipal consents to operate 10 motor coaches between Trenton and Camden. Other petitioners whose applications in connection with the same route were denied are:

P. J. McGuire, Inc.; the White Way Tours; the Worth Motor Bus Corporation; the Penjersey Rapid Transit Company. To each of these latter decisions the commission attached a copy of its decision in the Pennsylvania General Transit-Nevin Bus Line, Inc.,-Public Service Coordinated Transport case.

Orders for Equipment

THE BURLINGTON TRANSPORTATION COMPANY has accepted delivery of two Type W 21-passenger observation Yellow motor coaches.

THE RICHMOND-GREYHOUND LINES, affiliated with the Richmond, Fredericksburg & Potomac, has accepted delivery of three Type 250, 33-passenger observation Yellow motor coaches.

THE UNION PACIFIC has accepted delivery of five A.C.F. 264" wheelbase motor coach chassis.

THE FONDA, JOHNSTOWN & GLOVERSVILLE has accepted delivery of one Mack Model BC 29-passenger motor coach, and one Mack Model AB 25-passenger motor coach.

THE UNION PACIFIC STAGES has accepted delivery of two Mack Model BK 231 $\frac{1}{4}$ " motor coach chassis.

THE READING TRANSPORTATION COMPANY has accepted delivery of four Mack Model BK 29-passenger motor coaches.

Motor Transport Officers

E. J. McSweeney has been appointed assistant manager, central district, of the Pacific Motor Transport Company, with headquarters at San Francisco, Cal., succeeding C. C. Collins, who has resigned.

L. G. Markel, assistant to the vice-president and general counsel of the Pacific Greyhound Lines, has been appointed assistant traffic manager. Prior to the consolidation of a number of west coast motor coach operating companies into the Pacific Greyhound Lines, Mr. Markel was traffic manager of the California Transit Company. He is a director of the National Association of Motor Coach Traffic Managers and is a member of the committee on Equipment standardization of the General Traffic Association of Motor Coach Operators of North America.

Among the Manufacturers

Walter Reynolds has been appointed zone administrator for the Dayton Rubber Manufacturing Company; he will cover territory in the south central section of the country.

Amos J. Shorey, New England distributor for Gardner automobiles, has been appointed special traveling sales representative of the La France-Republic Sales Corporation. Mr. Shorey will cover the New England states and eastern New York and will maintain permanent headquarters at Arlington, Mass.

Edwin T. Herbig has been appointed manager of the Boston branch of the General Motors Truck Company, succeeding Vaughn Smith who has accepted a leave of absence pending another assignment, on account of ill health. P. E. O'Connor, who has served as acting manager of the Boston branch during the illness of Mr. Smith, will resume his activities as eastern regional sales manager.

Net earnings of \$1,048,000, the equivalent of \$1.31 a share on its 800,000 shares of common stock outstanding, was reported by the White Motor Company, for the six months ending June 30. The foregoing figure compares with net earnings of \$1,404,000 for the corresponding six months of 1929 and is approximately \$250,000 in excess of the regular dividend requirements for the half year. The directors declared a regular quarterly dividend of 50 cents a share, which was doubled from 25 cents late last year, payable September 30 to stockholders of record at the close of business September 12. Current assets, as of June 30, against current liabilities continued at a ratio of more than 10 to 1. Sales during the first half of 1930 exceeded \$21,000,000 and, while slightly less than in 1929, were nevertheless approximately 90 per cent of that peak period. The volume of White sales in June ran ahead of the May business, although the latter is normally the biggest month of the year in the industry.